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## SEQUENCE LISTING

<110> Harris, Peter C., Ward, Christopher J., Rossetti, Sandro, and Torres, Vicente E.

<120> Polycystic Kidney Disease Nucleic Acids  
and Proteins

<130> 07039/386US1

<140> 10/501,834

<141> 2004-07-19

<150> PCT/US03/02038

<151> 2003-01-23

<150> 60/351,110

<151> 2002-01-23

<160> 221

<170> FastSEQ for Windows Version 4.0

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Ala Gly Gly Thr Trp Ile Thr Val Ile Phe Asp Gly Leu Glu Leu Gly
 35          40          45
Val Leu Tyr Pro Asn Asn Gly Ser Gln Leu Glu Ile His Leu Val Asn
 50          55          60
Val Asn Met Val Val Pro Ala Leu Arg Ser Val Pro Cys Asp Val Phe
 65          70          75          80
Pro Val Phe Leu Asp Leu Pro Val Val Thr Cys Arg Thr Arg Ser Val
 85          90          95
Leu Ser Glu Ala His Glu Gly Leu Tyr Phe Leu Glu Ala Tyr Phe Gly
100          105          110
Gly Gln Leu Val Ser Ser Pro Asn Pro Gly Pro Arg Asp Ser Cys Thr
115          120          125
Phe Lys Phe Ser Lys Ala Gln Thr Pro Ile Val His Gln Val Tyr Pro

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|   |   |     |     |     |
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| Pro Ser Gly Val   | Pro Gly Lys Leu Ile His Val Tyr Gly Trp Ile Ile |     |     |     |
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| Thr Gly Arg Leu Glu Thr Phe Asp Phe Asp Ala Glu Tyr Ile Asp Ser |   |     |     |     |
|   | 165   | 170 | 175 |     |
| Pro Val Ile Leu Glu Ala Gln Gly Asp Lys Trp Val Thr Pro Cys Ser |   |     |     |     |
|   | 180   | 185 | 190 |     |
| Leu Ile Asn Arg Gln Met Gly Ser Cys Tyr Pro Ile Gln Glu Asp His |   |     |     |     |
|   | 195   | 200 | 205 |     |
| Gly Leu Gly Thr Leu Gln Cys His Val Glu Gly Asp Tyr Ile Gly Ser |   |     |     |     |
|   | 210   | 215 | 220 |     |
| Gln Asn Val Ser Phe Ser Val Phe Asn Lys Gly Lys Ser Met Val His |   |     |     |     |
| 225   | 230   | 235 | 240 |     |
| Lys Lys Ala Trp Leu Ile Ser Ala Lys Gln Asp Leu Phe Leu Tyr Gln |   |     |     |     |
|   | 245   | 250 | 255 |     |
| Thr His Ser Glu Ile Leu Ser Val Phe Pro Glu Thr Gly Ser Leu Gly |   |     |     |     |
|   | 260   | 265 | 270 |     |
| Gly Arg Thr Asn Ile Thr Ile Thr Gly Asp Phe Phe Asp Asn Ser Ala |   |     |     |     |
|   | 275   | 280 | 285 |     |
| Gln Val Thr Ile Ala Gly Ile Pro Cys Asp Ile Arg His Val Ser Pro |   |     |     |     |
|   | 290   | 295 | 300 |     |
| Arg Lys Ile Glu Cys Thr Thr Arg Ala Pro Gly Lys Asp Val Arg Leu |   |     |     |     |
| 305   | 310   | 315 | 320 |     |
| Thr Thr Pro Gln Pro Gly Asn Arg Gly Leu Leu Phe Glu Val Gly Asp |   |     |     |     |
|   | 325   | 330 | 335 |     |
| Ala Val Glu Gly Leu Glu Leu Thr Glu Ala Thr Pro Gly Tyr Arg Trp |   |     |     |     |
|   | 340   | 345 | 350 |     |
| Gln Ile Val Pro Asn Ala Ser Ser Pro Phe Gly Phe Trp Ser Gln Glu |   |     |     |     |
|   | 355   | 360 | 365 |     |
| Gly Gln Pro Phe Arg Ala Arg Leu Ser Gly Phe Phe Val Ala Pro Glu |   |     |     |     |
|   | 370   | 375 | 380 |     |
| Thr Asn Asn Tyr Thr Phe Trp Ile Gln Ala Asp Ser Gln Ala Ser Leu |   |     |     |     |
| 385   | 390   | 395 | 400 |     |
| His Phe Ser Trp Ser Glu Glu Pro Arg Thr Lys Val Lys Val Ala Ser |   |     |     |     |
|   | 405   | 410 | 415 |     |
| Ile Ser Val Gly Thr Ala Asp Trp Phe Asp Ser Trp Glu Gln Asn Arg |   |     |     |     |
|   | 420   | 425 | 430 |     |
| Asp Glu Gly Thr Trp Gln Gln Lys Thr Pro Lys Leu Glu Leu Leu Gly |   |     |     |     |
|   | 435   | 440 | 445 |     |
| Gly Ala Met Tyr Tyr Leu Glu Ala Glu His His Gly Ile Ala Pro Ser |   |     |     |     |
|   | 450   | 455 | 460 |     |
| Arg Gly Met Arg Ile Gly Val Gln Ile His Asn Thr Trp Leu Asn Pro |   |     |     |     |
| 465   | 470   | 475 | 480 |     |
| Asp Val Val Thr Thr Tyr Leu Arg Glu Lys His Gln Ile Arg Val Arg |   |     |     |     |
|   | 485   | 490 | 495 |     |
| Ala Gln Arg Leu Pro Glu Val Gln Val Leu Asn Val Ser Gly Arg Gly |   |     |     |     |
|   | 500   | 505 | 510 |     |
| Asn Phe Phe Leu Thr Trp Asp Asn Val Ser Ser Gln Pro Ile Pro Ala |   |     |     |     |
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| Asn Ala Thr Ala His Leu Ile Gln Thr Thr Ile Glu Leu Leu Ala     |   |     |     |     |
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| Val Lys Cys Lys Leu Glu Pro Leu Trp Ser Asn Ile Leu Leu Arg Leu |   |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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| Gly | Phe | Glu | Arg | Gly | Pro | Glu | Val | Ser | Asn | Ser | Asp | Gly | Asp | Leu | Thr |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |
| Ser | Gly | Thr | Glu | Pro | Phe | Cys | Gly | Arg | Phe | Ser | Leu | Arg | Gln | Pro | Arg |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |
| His | Leu | Val | Leu | Thr | Pro | Pro | Ala | Ala | Gln | Lys | Gly | Tyr | Arg | Leu | Asp |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |
| Gln | Tyr | Thr | His | Leu | Cys | Leu | Ala | Tyr | Lys | Gly | His | Met | Asn | Lys | Ile |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |
| Leu | Lys | Met | Ile | Val | Ser | Phe | Thr | Ile | Gly | Phe | Gln | Asn | Met | Val | Lys |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     | 640 |     |
| Asn | Thr | Thr | Cys | Asp | Trp | Ser | Leu | Thr | Arg | Thr | Ser | Pro | Glu | Ser | Trp |
|     |     |     | 645 |     |     |     |     |     | 650 |     |     |     |     | 655 |     |
| Gln | Phe | Asp | Cys | Thr | Asp | Leu | Trp | Glu | Thr | Cys | Val | Arg | Cys | Phe | Gly |
|     |     | 660 |     |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Asp | Leu | Gln | Pro | Pro | Pro | Ala | Asn | Ser | Pro | Val | Leu | Val | His | Gln | Ile |
|     | 675 |     |     |     |     |     | 680 |     |     |     |     |     | 685 |     |     |
| Asn | Leu | Leu | Pro | Leu | Ala | Gln | Glu | Thr | Gly | Leu | Phe | Tyr | Val | Asp | Glu |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Ile | Ile | Ile | Ala | Asp | Thr | Asn | Val | Thr | Val | Ser | Gln | Ala | Asp | Ser | Gly |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     | 720 |     |
| Thr | Ala | Arg | Pro | Gly | Gly | Asn | Leu | Val | Glu | Ser | Val | Ser | Val | Val | Gly |
|     |     |     | 725 |     |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Ser | Pro | Pro | Val | Tyr | Ser | Val | Thr | Ser | Trp | Leu | Ala | Gly | Cys | Gly | Thr |
|     |     | 740 |     |     |     |     | 745 |     |     |     |     |     | 750 |     |     |
| Glu | Leu | Pro | Leu | Ile | Thr | Ala | Arg | Ser | Val | Pro | Thr | Glu | Gly | Thr | Glu |
|     | 755 |     |     |     |     | 760 |     |     |     |     |     | 765 |     |     |     |
| Glu | Gly | Ser | Gly | Leu | Val | Leu | Val | Thr | Thr | Gln | Arg | Arg | Gln | Arg | Thr |
|     | 770 |     |     |     |     | 775 |     |     |     | 780 |     |     |     |     |     |
| Ser | Pro | Pro | Leu | Gly | Gly | His | Phe | Arg | Ile | Gln | Leu | Pro | Asn | Thr | Val |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     | 800 |     |
| Ile | Ser | Asp | Val | Pro | Val | Gln | Ile | Ser | Ala | His | His | Leu | His | Gln | Leu |
|     |     |     | 805 |     |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Leu | Gln | Asn | Asn | Ala | Asp | Asp | Phe | Thr | Ser | Arg | Tyr | Leu | Asn | Ala | Ser |
|     |     | 820 |     |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Asp | Phe | Thr | Val | Lys | Glu | Asp | Leu | Tyr | Thr | Cys | Tyr | Glu | His | Val | Trp |
|     | 835 |     |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Thr | Leu | Ser | Trp | Ser | Thr | Gln | Ile | Gly | Asp | Leu | Pro | Asn | Phe | Ile | Arg |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Val | Ser | Asp | Glu | Asn | Leu | Thr | Gly | Val | Asn | Pro | Ala | Ala | Ala | Thr | Arg |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     | 880 |     |
| Val | Val | Tyr | Asp | Gly | Gly | Val | Phe | Leu | Gly | Pro | Ile | Phe | Gly | Asp | Met |
|     |     |     | 885 |     |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Leu | Ala | Thr | Ala | Asn | Gln | His | Thr | Gln | Val | Val | Val | Arg | Val | Asn | Asp |
|     |     | 900 |     |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Val | Pro | Ala | His | Cys | Pro | Gly | Ser | Cys | Ser | Phe | Gln | Tyr | Leu | Gln | Gly |
|     | 915 |     |     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |
| Ser | Thr | Pro | Cys | Val | His | Ser | Val | Trp | Tyr | Ser | Ile | Asp | Gly | Asp | Ile |
|     | 930 |     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     |
| Asn | Leu | Met | Ile | Tyr | Ile | Thr | Gly | Thr | Gly | Phe | Ser | Gly | Asp | Ser | Gln |
| 945 |     |     |     |     | 950 |     |     |     |     | 955 |     |     |     | 960 |     |
| Phe | Leu | Gln | Val | Thr | Val | Asn | Lys | Thr | Ser | Cys | Lys | Val | Ile | Phe | Ser |

|      |      |      |      |     |      |      |      |      |     |      |      |      |      |     |      |
|------|------|------|------|-----|------|------|------|------|-----|------|------|------|------|-----|------|
|      |      |      |      | 965 |      |      |      |      | 970 |      |      |      |      | 975 |      |
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| Arg  | Gly  | Asp  | Tyr  | Ser | Ala  | Val  | Leu  | Pro  | Arg | Ala  | Phe  | Thr  | Tyr  | Val | Ser  |
|      | 1090 |      |      |     |      | 1095 |      |      |     |      | 1100 |      |      |     |      |
| Ser  | Leu  | Asn  | Pro  | Val | Ile  | Val  | Thr  | Leu  | Ser | Arg  | Asn  | Ile  | Ser  | Asn | Ile  |
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| Ala  | Gly  | Gly  | Glu  | Thr | Leu  | Val  | Ile  | Gly  | Val | Ala  | Arg  | Leu  | Met  | Asn | Tyr  |
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| His  | Thr  | Gln  | Ser  | Ala | Trp  | Gly  | Leu  | Glu  | Val | Ala  | Leu  | Pro  | Pro  | Leu | Pro  |
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| Ile  | Glu  | Pro  | Cys  | Cys | Gly  | Ser  | Leu  | Leu  | Gly | Gly  | Thr  | Ile  | Leu  | Ser | Ile  |
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|      | 1330 |      |      |     |      | 1335 |      |      |     |      | 1340 |      |      |     |      |
| Gly  | Asn  | Val  | Ser  | Leu | Ser  | Gly  | Cys  | Ser  | Ile | Pro  | Leu  | His  | Ser  | Leu | Glu  |
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|---|------|------|
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| Val Arg Gly Leu Leu Leu Asn Ser Arg Arg Arg Ser Val Arg Val Asp |      |      |
| 1410  | 1415 | 1420 |
| Leu Ser Gly Pro Phe Thr Cys Val Ile Leu Ser Leu Gly Asp His Thr |      |      |
| 1425  | 1430 | 1435 |
| Ile Leu Cys Gln Val Ser Leu Glu Gly Asp Pro Leu Pro Gly Ala Ser |      | 1440 |
| 1445  | 1450 | 1455 |
| Phe Ser Leu Asn Val Thr Val Leu Val Asn Gly Leu Thr Ser Glu Cys |      |      |
| 1460  | 1465 | 1470 |
| Gln Gly Asn Cys Thr Leu Phe Ile Arg Glu Glu Ala Ser Pro Val Met |      |      |
| 1475  | 1480 | 1485 |
| Asp Ala Leu Ser Thr Asn Thr Ser Gly Ser Leu Thr Thr Val Leu Ile |      |      |
| 1490  | 1495 | 1500 |
| Arg Gly Gln Arg Leu Ala Thr Thr Ala Asp Glu Pro Met Val Phe Val |      |      |
| 1505  | 1510 | 1515 |
| Asp Asp Gln Leu Pro Cys Asn Val Thr Phe Phe Asn Ala Ser His Val |      | 1520 |
| 1525  | 1530 | 1535 |
| Val Cys Gln Thr Arg Asp Leu Ala Pro Gly Pro His Tyr Leu Ser Val |      |      |
| 1540  | 1545 | 1550 |
| Phe Tyr Thr Arg Asn Gly Tyr Ala Cys Ser Gly Asn Val Ser Arg His |      |      |
| 1555  | 1560 | 1565 |
| Phe Tyr Ile Met Pro Gln Val Phe His Tyr Phe Pro Lys Asn Phe Ser |      |      |
| 1570  | 1575 | 1580 |
| Leu His Gly Gly Ser Leu Leu Thr Ile Glu Gly Thr Gly Leu Arg Gly |      |      |
| 1585  | 1590 | 1595 |
| Gln Asn Thr Thr Ser Val Tyr Ile Asp Gln Gln Thr Cys Leu Thr Val |      | 1600 |
| 1605  | 1610 | 1615 |
| Asn Ile Gly Ala Glu Leu Ile Arg Cys Ile Val Pro Thr Gly Asn Gly |      |      |
| 1620  | 1625 | 1630 |
| Ser Val Ala Leu Glu Ile Glu Val Asp Gly Leu Trp Tyr His Ile Gly |      |      |
| 1635  | 1640 | 1645 |
| Val Ile Gly Tyr Asn Lys Ala Phe Thr Pro Glu Leu Ile Ser Ile Ser |      |      |
| 1650  | 1655 | 1660 |
| Gln Ser Asp Asp Ile Leu Thr Phe Ala Val Ala Gln Ile Ser Gly Ala |      |      |
| 1665  | 1670 | 1675 |
| Ala Asn Ile Asp Ile Phe Ile Gly Met Ser Pro Cys Val Gly Val Ser |      | 1680 |
| 1685  | 1690 | 1695 |
| Gly Asn His Thr Val Leu Gln Cys Val Val Pro Ser Leu Pro Ala Gly |      |      |
| 1700  | 1705 | 1710 |
| Glu Tyr His Val Arg Gly Tyr Asp Cys Ile Arg Gly Trp Ala Ser Ser |      |      |
| 1715  | 1720 | 1725 |
| Ala Leu Val Phe Thr Ser Arg Val Ile Ile Thr Ala Val Thr Glu Asn |      |      |
| 1730  | 1735 | 1740 |
| Phe Gly Cys Leu Gly Gly Arg Leu Val His Val Phe Gly Ala Gly Phe |      |      |
| 1745  | 1750 | 1755 |
| Ser Pro Gly Asn Val Ser Ala Ala Val Cys Gly Ala Pro Cys Arg Val |      | 1760 |
| 1765  | 1770 | 1775 |
| Leu Ala Asn Ala Thr Val Ser Ala Phe Ser Cys Leu Val Leu Pro Leu |      |      |
| 1780  | 1785 | 1790 |
| Asp Val Ser Leu Ala Phe Leu Cys Gly Leu Lys Arg Glu Glu Asp Ser |      |      |

|   |      |      |
|---|------|------|
| 1795  | 1800 | 1805 |
| Cys Glu Ala Ala Arg His Thr Tyr Val Gln Cys Asp Leu Thr Val Ala |      |      |
| 1810  | 1815 | 1820 |
| Met Ala Thr Glu Gln Leu Leu Glu Ser Trp Pro Tyr Leu Tyr Ile Cys |      |      |
| 1825  | 1830 | 1835 |
| Glu Glu Ser Ser Gln Cys Leu Phe Val Pro Asp His Trp Ala Glu Ser |      | 1840 |
| 1845  | 1850 | 1855 |
| Met Phe Pro Ser Phe Ser Gly Leu Phe Ile Ser Pro Lys Leu Glu Arg |      |      |
| 1860  | 1865 | 1870 |
| Asp Glu Val Leu Ile Tyr Asn Ser Ser Cys Asn Ile Thr Met Glu Thr |      |      |
| 1875  | 1880 | 1885 |
| Glu Ala Glu Met Glu Cys Glu Thr Pro Asn Gln Pro Ile Thr Val Lys |      |      |
| 1890  | 1895 | 1900 |
| Ile Thr Glu Ile Arg Lys Arg Trp Gly Gln Asn Thr Gln Gly Asn Phe |      |      |
| 1905  | 1910 | 1915 |
| Ser Leu Gln Phe Cys Arg Arg Trp Ser Arg Thr His Ser Trp Phe Pro |      | 1920 |
| 1925  | 1930 | 1935 |
| Glu Arg Leu Pro Gln Asp Gly Asp Asn Val Thr Val Glu Asn Gly Gln |      |      |
| 1940  | 1945 | 1950 |
| Leu Leu Leu Asp Thr Asn Thr Ser Ile Leu Asn Leu Leu His Ile     |      |      |
| 1955  | 1960 | 1965 |
| Lys Gly Gly Lys Leu Ile Phe Met Ala Pro Gly Pro Ile Glu Leu Arg |      |      |
| 1970  | 1975 | 1980 |
| Ala His Ala Ile Leu Val Ser Asp Gly Gly Glu Leu Arg Ile Gly Ser |      |      |
| 1985  | 1990 | 1995 |
| Glu Asp Lys Pro Phe Gln Gly Arg Ala Gln Ile Thr Leu Tyr Gly Ser |      | 2000 |
| 2005  | 2010 | 2015 |
| Ser Tyr Ser Thr Pro Phe Phe Pro Tyr Gly Val Lys Phe Leu Ala Val |      |      |
| 2020  | 2025 | 2030 |
| Arg Asn Gly Thr Leu Ser Leu His Gly Ser Leu Pro Glu Val Ile Val |      |      |
| 2035  | 2040 | 2045 |
| Thr Cys Leu Arg Ala Thr Ala His Ala Leu Asp Thr Val Leu Ala Leu |      |      |
| 2050  | 2055 | 2060 |
| Glu Asp Ala Val Asp Trp Asn Pro Gly Asp Glu Val Val Ile Ile Ser |      |      |
| 2065  | 2070 | 2075 |
| Gly Thr Gly Val Lys Gly Ala Lys Pro Met Glu Glu Ile Val Thr Val |      | 2080 |
| 2085  | 2090 | 2095 |
| Glu Thr Val Gln Asp Thr Asp Leu Tyr Leu Lys Ser Pro Leu Arg Tyr |      |      |
| 2100  | 2105 | 2110 |
| Ser His Asn Phe Thr Glu Asn Trp Val Ala Gly Glu His His Ile Leu |      |      |
| 2115  | 2120 | 2125 |
| Lys Ala Thr Val Ala Leu Leu Ser Arg Ser Ile Thr Ile Gln Gly Asn |      |      |
| 2130  | 2135 | 2140 |
| Leu Thr Asn Glu Arg Glu Lys Leu Leu Val Ser Cys Gln Glu Ala Asn |      |      |
| 2145  | 2150 | 2155 |
| Ala Pro Glu Gly Asn Leu Gln His Cys Leu Tyr Ser Met Ser Glu Lys |      | 2160 |
| 2165  | 2170 | 2175 |
| Met Leu Gly Ser Arg Asp Met Gly Ala Arg Val Ile Val Gln Ser Phe |      |      |
| 2180  | 2185 | 2190 |
| Pro Glu Glu Pro Ser Gln Val Gln Leu Lys Gly Val Gln Phe Gln Val |      |      |
| 2195  | 2200 | 2205 |
| Leu Gly Gln Ala Phe His Lys His Leu Ser Ser Leu Thr Leu Val Gly |      |      |

|   |   |      |
|---|---|------|
| 2210  | 2215                                    | 2220 |
| Ala Met Arg Glu Ser Phe   | Ile Gln Gly Cys Thr Val Arg Asn Ser Phe |      |
| 2225  | 2230                                    | 2235 |
| Ser Arg Gly Leu Ser Met Cys Gly Thr Leu Gly Leu Lys Val Asp Ser |   | 2240 |
| 2245  | 2250                                    | 2255 |
| Asn Val Phe Tyr Asn Ile Leu Gly His Ala Leu Leu Val Gly Thr Cys |   |      |
| 2260  | 2265                                    | 2270 |
| Thr Glu Met Arg Tyr Ile Ser Trp Glu Ala Ile His Gly Arg Lys Asp |   |      |
| 2275  | 2280                                    | 2285 |
| Asp Trp Ser Gly His Gly Asn Ile Ile Arg Asn Asn Val Ile Ile Gln |   |      |
| 2290  | 2295                                    | 2300 |
| Val Ser Gly Ala Glu Gly Leu Ser Asn Pro Glu Met Leu Thr Pro Ser |   |      |
| 2305  | 2310                                    | 2315 |
| Gly Ile Tyr Ile Cys Ser Pro Thr Asn Val Ile Glu Gly Asn Arg Val |   | 2320 |
| 2325  | 2330                                    | 2335 |
| Cys Gly Ala Gly Tyr Gly Tyr Phe Phe His Leu Met Thr Asn Gln Thr |   |      |
| 2340  | 2345                                    | 2350 |
| Ser Gln Ala Pro Leu Leu Ser Phe Thr Gln Asn Ile Ala His Ser Cys |   |      |
| 2355  | 2360                                    | 2365 |
| Thr Arg Tyr Gly Leu Phe Val Tyr Pro Lys Phe Gln Pro Pro Trp Asp |   |      |
| 2370  | 2375                                    | 2380 |
| Asn Val Thr Gly Thr Thr Leu Phe Gln Ser Phe Thr Val Trp Glu Ser |   |      |
| 2385  | 2390                                    | 2395 |
| Ala Gly Gly Ala Gln Ile Phe Arg Ser Ser Asn Leu Arg Leu Lys Asn |   |      |
| 2405  | 2410                                    | 2415 |
| Phe Lys Val Tyr Ser Cys Arg Asp Phe Gly Ile Asp Val Leu Glu Ser |   |      |
| 2420  | 2425                                    | 2430 |
| Asp Ala Asn Thr Ser Val Thr Asp Ser Leu Leu Leu Gly His Phe Ala |   |      |
| 2435  | 2440                                    | 2445 |
| His Lys Gly Ser Leu Cys Met Ser Ser Gly Ile Lys Thr Pro Lys Arg |   |      |
| 2450  | 2455                                    | 2460 |
| Trp Glu Leu Met Val Ser Asn Thr Thr Phe Val Asn Phe Asp Leu Ile |   |      |
| 2465  | 2470                                    | 2475 |
| Asn Cys Val Ala Ile Arg Thr Cys Ser Asp Cys Ser Gln Gly Gln Gly |   | 2480 |
| 2485  | 2490                                    | 2495 |
| Gly Phe Thr Val Lys Thr Ser Gln Leu Lys Phe Thr Asn Ser Ser Asn |   |      |
| 2500  | 2505                                    | 2510 |
| Leu Val Ala Phe Pro Phe Pro His Ala Ala Ile Leu Glu Asp Leu Asp |   |      |
| 2515  | 2520                                    | 2525 |
| Gly Ser Leu Ser Gly Lys Asn Arg Ser His Ile Leu Ala Ser Met Glu |   |      |
| 2530  | 2535                                    | 2540 |
| Thr Leu Ser Ala Ser Cys Leu Val Asn Ser Ser Phe Gly Arg Val Val |   |      |
| 2545  | 2550                                    | 2555 |
| His Gly Ser Ala Cys Gly Gly Gly Val Leu Phe His Arg Met Ser Ile |   | 2560 |
| 2565  | 2570                                    | 2575 |
| Gly Leu Ala Asn Thr Pro Glu Val Ser Tyr Asp Leu Thr Met Thr Asp |   |      |
| 2580  | 2585                                    | 2590 |
| Ser Arg Asn Lys Thr Thr Thr Val Asn Tyr Val Arg Asp Thr Leu Ser |   |      |
| 2595  | 2600                                    | 2605 |
| Asn Pro Arg Gly Trp Met Ala Leu Leu Leu Asp Gln Glu Thr Tyr Ser |   |      |
| 2610  | 2615                                    | 2620 |
| Leu Gln Ser Glu Asn Leu Trp Ile Asn Arg Ser Leu Gln Tyr Ser Ala |   |      |

|   |      |      |      |      |      |      |
|---|------|------|------|------|------|------|
| 2625  |      | 2630 |      | 2635 |      | 2640 |
| Thr Phe Asp Asn Phe Ala Pro Gly Asn Tyr Leu Leu Leu Val His Thr |      |      |      |      |      |      |
|   | 2645 |      | 2650 |      | 2655 |      |
| Asp Leu Pro Pro Tyr Pro Asp Ile Leu Leu Arg Cys Gly Ser Arg Val |      |      |      |      |      |      |
|   | 2660 |      | 2665 |      | 2670 |      |
| Gly Leu Ser Phe Pro Phe Leu Pro Ser Pro Gly Gln Asn Gln Gly Cys |      |      |      |      |      |      |
|   | 2675 |      | 2680 |      | 2685 |      |
| Asp Trp Phe Phe Asn Ser Gln Leu Arg Gln Leu Thr Tyr Leu Val Ser |      |      |      |      |      |      |
|   | 2690 |      | 2695 |      | 2700 |      |
| Gly Glu Gly Gln Val Gln Val Ile Leu Arg Val Lys Glu Gly Met Pro |      |      |      |      |      |      |
| 2705  |      | 2710 |      | 2715 |      | 2720 |
| Pro Thr Ile Ser Ala Ser Thr Ser Ala Pro Glu Ser Ala Leu Lys Trp |      |      |      |      |      |      |
|   | 2725 |      | 2730 |      | 2735 |      |
| Ser Leu Pro Glu Thr Trp Gln Gly Val Glu Glu Gly Trp Gly Gly Tyr |      |      |      |      |      |      |
|   | 2740 |      | 2745 |      | 2750 |      |
| Asn Asn Thr Ile Pro Gly Pro Gly Asp Asp Val Leu Ile Leu Pro Asn |      |      |      |      |      |      |
|   | 2755 |      | 2760 |      | 2765 |      |
| Arg Thr Val Leu Val Asp Thr Asp Leu Pro Phe Phe Lys Gly Leu Tyr |      |      |      |      |      |      |
|   | 2770 |      | 2775 |      | 2780 |      |
| Val Met Gly Thr Leu Asp Phe Pro Val Asp Arg Ser Asn Val Leu Ser |      |      |      |      |      |      |
| 2785  |      | 2790 |      | 2795 |      | 2800 |
| Val Ala Cys Met Val Ile Ala Gly Gly Glu Leu Lys Val Gly Thr Leu |      |      |      |      |      |      |
|   | 2805 |      | 2810 |      | 2815 |      |
| Glu Asn Pro Leu Glu Lys Glu Gln Lys Leu Leu Ile Leu Leu Arg Ala |      |      |      |      |      |      |
|   | 2820 |      | 2825 |      | 2830 |      |
| Ser Glu Gly Val Phe Cys Asp Arg Met Asn Gly Ile His Ile Asp Pro |      |      |      |      |      |      |
|   | 2835 |      | 2840 |      | 2845 |      |
| Gly Thr Ile Gly Val Tyr Gly Lys Val His Leu Tyr Ser Ala Tyr Pro |      |      |      |      |      |      |
|   | 2850 |      | 2855 |      | 2860 |      |
| Lys Asn Ser Trp Thr His Leu Gly Ala Asp Ile Ala Ser Gly Asn Glu |      |      |      |      |      |      |
| 2865  |      | 2870 |      | 2875 |      | 2880 |
| Arg Ile Ile Val Glu Asp Ala Val Asp Trp Arg Pro His Asp Lys Ile |      |      |      |      |      |      |
|   | 2885 |      | 2890 |      | 2895 |      |
| Val Leu Ser Ser Ser Tyr Glu Pro His Glu Ala Glu Val Leu Thr     |      |      |      |      |      |      |
|   | 2900 |      | 2905 |      | 2910 |      |
| Val Lys Glu Val Lys Gly His His Val Arg Ile Tyr Glu Arg Leu Lys |      |      |      |      |      |      |
|   | 2915 |      | 2920 |      | 2925 |      |
| His Arg His Ile Gly Ser Val His Val Thr Glu Asp Gly Arg His Ile |      |      |      |      |      |      |
|   | 2930 |      | 2935 |      | 2940 |      |
| Arg Leu Ala Ala Glu Val Gly Leu Leu Thr Arg Asn Ile Gln Ile Gln |      |      |      |      |      |      |
| 2945  |      | 2950 |      | 2955 |      | 2960 |
| Pro Asp Val Ser Cys Arg Gly Arg Leu Phe Val Gly Ser Phe Arg Lys |      |      |      |      |      |      |
|   | 2965 |      | 2970 |      | 2975 |      |
| Ser Ser Arg Glu Glu Phe Ser Gly Val Leu Gln Leu Leu Asn Val Glu |      |      |      |      |      |      |
|   | 2980 |      | 2985 |      | 2990 |      |
| Ile Gln Asn Phe Gly Ser Pro Leu Tyr Ser Ser Val Glu Phe Ser Asn |      |      |      |      |      |      |
|   | 2995 |      | 3000 |      | 3005 |      |
| Val Ser Ala Gly Ser Trp Ile Ile Ser Ser Thr Leu His Gln Ser Cys |      |      |      |      |      |      |
|   | 3010 |      | 3015 |      | 3020 |      |
| Gly Gly Gly Ile His Ala Ala Ala Ser His Gly Val Leu Leu Asn Asp |      |      |      |      |      |      |
| 3025  |      | 3030 |      | 3035 |      | 3040 |
| Asn Ile Val Phe Gly Thr Ala Gly His Gly Ile Asp Leu Glu Gly Gln |      |      |      |      |      |      |

|      |     |     |     |      |      |     |     |      |      |      |     |     |     |      |      |
|------|-----|-----|-----|------|------|-----|-----|------|------|------|-----|-----|-----|------|------|
| 3045 |     |     |     | 3050 |      |     |     | 3055 |      |      |     |     |     |      |      |
| Ala  | Tyr | Thr | Val | Thr  | Asn  | Asn | Leu | Val  | Val  | Leu  | Met | Thr | Gln | Pro  | Ala  |
| 3060 |     |     |     | 3065 |      |     |     | 3070 |      |      |     |     |     |      |      |
| Trp  | Ser | Thr | Ile | Trp  | Val  | Ala | Gly | Ile  | Lys  | Val  | Asn | Gln | Val | Lys  | Asp  |
| 3075 |     |     |     | 3080 |      |     |     | 3085 |      |      |     |     |     |      |      |
| Ile  | Asn | Leu | His | Gly  | Asn  | Val | Val | Ala  | Gly  | Ser  | Glu | Arg | Leu | Gly  | Phe  |
| 3090 |     |     |     | 3095 |      |     |     | 3100 |      |      |     |     |     |      |      |
| His  | Ile | Arg | Gly | His  | Lys  | Cys | Ser | Ser  | Cys  | Glu  | Leu | Leu | Trp | Ser  | Asp  |
| 3105 |     |     |     |      | 3110 |     |     |      |      | 3115 |     |     |     |      | 3120 |
| Asn  | Val | Ala | His | Ser  | Ser  | Leu | His | Gly  | Leu  | His  | Leu | Tyr | Lys | Glu  | Ser  |
|      |     |     |     | 3125 |      |     |     |      | 3130 |      |     |     |     | 3135 |      |
| Gly  | Leu | Asp | Asn | Cys  | Thr  | Arg | Ile | Ser  | Gly  | Phe  | Leu | Ala | Phe | Lys  | Asn  |
|      |     |     |     | 3140 |      |     |     |      | 3145 |      |     |     |     | 3150 |      |
| Phe  | Asp | Tyr | Gly | Ala  | Met  | Leu | His | Val  | Glu  | Asn  | Ser | Val | Glu | Ile  | Glu  |
|      |     |     |     | 3155 |      |     |     |      | 3160 |      |     |     |     | 3165 |      |
| Asn  | Ile | Thr | Leu | Val  | Asp  | Asn | Thr | Ile  | Gly  | Leu  | Leu | Ala | Val | Val  | Tyr  |
|      |     |     |     | 3170 |      |     |     |      | 3175 |      |     |     |     | 3180 |      |
| Val  | Phe | Ser | Ala | Pro  | Gln  | Asn | Ser | Val  | Lys  | Lys  | Val | Gln | Ile | Val  | Leu  |
| 3185 |     |     |     |      | 3190 |     |     |      |      | 3195 |     |     |     |      | 3200 |
| Arg  | Asn | Ser | Val | Ile  | Val  | Ala | Thr | Ser  | Ser  | Phe  | Asp | Cys | Ile | Gln  |      |
|      |     |     |     | 3205 |      |     |     |      | 3210 |      |     |     |     | 3215 |      |
| Asp  | Lys | Val | Lys | Pro  | His  | Ser | Ala | Asn  | Leu  | Thr  | Ser | Thr | Asp | Arg  | Ala  |
|      |     |     |     | 3220 |      |     |     |      | 3225 |      |     |     |     | 3230 |      |
| Pro  | Ser | Asn | Pro | Arg  | Gly  | Gly | Arg | Ile  | Gly  | Ile  | Leu | Trp | Pro | Val  | Phe  |
|      |     |     |     | 3235 |      |     |     |      | 3240 |      |     |     |     | 3245 |      |
| Thr  | Ser | Glu | Pro | Asn  | Gln  | Trp | Pro | Gln  | Glu  | Pro  | Trp | His | Lys | Val  | Arg  |
|      |     |     |     | 3250 |      |     |     |      | 3255 |      |     |     |     | 3260 |      |
| Asn  | Asp | His | Ser | Ile  | Ser  | Gly | Ile | Met  | Lys  | Leu  | Gln | Asp | Val | Thr  | Phe  |
| 3265 |     |     |     |      | 3270 |     |     |      |      | 3275 |     |     |     |      | 3280 |
| Ser  | Ser | Phe | Val | Lys  | Ser  | Cys | Tyr | Ser  | Asp  | Asp  | Leu | Asp | Val | Cys  | Ile  |
|      |     |     |     | 3285 |      |     |     |      | 3290 |      |     |     |     | 3295 |      |
| Leu  | Pro | Asn | Ala | Glu  | Asn  | Ser | Gly | Ile  | Met  | His  | Pro | Ile | Thr | Ala  | Glu  |
|      |     |     |     | 3300 |      |     |     |      | 3305 |      |     |     |     | 3310 |      |
| Arg  | Thr | Arg | Met | Leu  | Lys  | Ile | Lys | Asp  | Lys  | Asn  | Lys | Phe | Tyr | Phe  | Pro  |
|      |     |     |     | 3315 |      |     |     |      | 3320 |      |     |     |     | 3325 |      |
| Ser  | Leu | Gln | Pro | Arg  | Lys  | Asp | Leu | Gly  | Lys  | Val  | Val | Cys | Pro | Glu  | Leu  |
|      |     |     |     | 3330 |      |     |     |      | 3335 |      |     |     |     | 3340 |      |
| Asp  | Cys | Ala | Ser | Pro  | Arg  | Lys | Tyr | Leu  | Phe  | Lys  | Asp | Leu | Asp | Gly  | Arg  |
| 3345 |     |     |     |      | 3350 |     |     |      |      | 3355 |     |     |     |      | 3360 |
| Ala  | Leu | Gly | Leu | Pro  | Pro  | Pro | Val | Ser  | Val  | Phe  | Pro | Lys | Thr | Glu  | Ala  |
|      |     |     |     | 3365 |      |     |     |      | 3370 |      |     |     |     | 3375 |      |
| Glu  | Trp | Thr | Ala | Ser  | Phe  | Phe | Asn | Ala  | Gly  | Thr  | Phe | Arg | Glu | Glu  | Gln  |
|      |     |     |     | 3380 |      |     |     |      | 3385 |      |     |     |     | 3390 |      |
| Lys  | Cys | Thr | Tyr | Gln  | Phe  | Leu | Met | Gln  | Gly  | Phe  | Ile | Cys | Lys | Gln  | Thr  |
|      |     |     |     | 3395 |      |     |     |      | 3400 |      |     |     |     | 3405 |      |
| Asp  | Gln | Val | Val | Leu  | Ile  | Leu | Asp | Ser  | Ala  | Asp  | Ala | Ile | Trp | Ala  | Ile  |
|      |     |     |     | 3410 |      |     |     |      | 3415 |      |     |     |     | 3420 |      |
| Gln  | Lys | Leu | Tyr | Pro  | Val  | Val | Ser | Val  | Thr  | Ser  | Gly | Phe | Val | Asp  | Val  |
| 3425 |     |     |     |      | 3430 |     |     |      |      | 3435 |     |     |     |      | 3440 |
| Phe  | Ser | Ser | Val | Asn  | Ala  | Asn | Ile | Pro  | Cys  | Ser  | Thr | Ser | Gly | Ser  | Val  |
|      |     |     |     | 3445 |      |     |     |      | 3450 |      |     |     |     | 3455 |      |
| Ser  | Thr | Phe | Tyr | Ser  | Ile  | Leu | Pro | Ile  | Arg  | Gln  | Ile | Thr | Lys | Val  | Cys  |

|      |      |     |     |     |      |      |     |     |     |      |      |     |     |     |     |
|------|------|-----|-----|-----|------|------|-----|-----|-----|------|------|-----|-----|-----|-----|
| 3460 |      |     |     |     | 3465 |      |     |     |     | 3470 |      |     |     |     |     |
| Phe  | Met  | Asp | Gln | Thr | Pro  | Gln  | Val | Leu | Arg | Phe  | Phe  | Leu | Leu | Gly | Asn |
| 3475 |      |     |     |     | 3480 |      |     |     |     | 3485 |      |     |     |     |     |
| Lys  | Ser  | Thr | Ser | Lys | Leu  | Leu  | Leu | Ala | Val | Phe  | Tyr  | His | Glu | Leu | Gln |
| 3490 |      |     |     |     | 3495 |      |     |     |     | 3500 |      |     |     |     |     |
| Ser  | Pro  | His | Val | Phe | Leu  | Gly  | Glu | Ser | Phe | Ile  | Pro  | Pro | Thr | Leu | Val |
| 3505 | 3510 |     |     |     |      | 3515 |     |     |     |      | 3520 |     |     |     |     |
| Gln  | Ser  | Ala | Ser | Leu | Leu  | Leu  | Asn | Glu | Ser | Ile  | Gly  | Ala | Asn | Tyr | Phe |
| 3525 |      |     |     |     | 3530 |      |     |     |     | 3535 |      |     |     |     |     |
| Asn  | Ile  | Met | Asp | Asn | Leu  | Leu  | Tyr | Val | Val | Leu  | Gln  | Gly | Glu | Glu | Pro |
| 3540 |      |     |     |     | 3545 |      |     |     |     | 3550 |      |     |     |     |     |
| Ile  | Glu  | Ile | Arg | Ser | Gly  | Val  | Ser | Ile | His | Leu  | Ala  | Leu | Thr | Val | Met |
| 3555 |      |     |     |     | 3560 |      |     |     |     | 3565 |      |     |     |     |     |
| Val  | Ser  | Val | Leu | Glu | Lys  | Gly  | Trp | Glu | Ile | Val  | Ile  | Leu | Glu | Arg | Leu |
| 3570 |      |     |     |     | 3575 |      |     |     |     | 3580 |      |     |     |     |     |
| Thr  | Asn  | Phe | Leu | Gln | Ile  | Gly  | Gln | Asn | Gln | Ile  | Arg  | Phe | Ile | His | Glu |
| 3585 | 3590 |     |     |     |      | 3595 |     |     |     |      | 3600 |     |     |     |     |
| Met  | Pro  | Gly | His | Glu | Thr  | Leu  | Lys | Ala | Ile | Ala  | Asp  | Ser | Arg | Ala |     |
| 3605 |      |     |     |     | 3610 |      |     |     |     | 3615 |      |     |     |     |     |
| Lys  | Arg  | Lys | Arg | Asn | Cys  | Pro  | Thr | Val | Thr | Cys  | Thr  | Ser | His | Tyr | Arg |
| 3620 |      |     |     |     | 3625 |      |     |     |     | 3630 |      |     |     |     |     |
| Arg  | Val  | Gly | Gln | Arg | Arg  | Pro  | Leu | Met | Met | Glu  | Met  | Asn | Ser | His | Arg |
| 3635 |      |     |     |     | 3640 |      |     |     |     | 3645 |      |     |     |     |     |
| Ala  | Ser  | Pro | Pro | Met | Thr  | Val  | Glu | Thr | Ile | Ser  | Lys  | Val | Ile | Val | Ile |
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| 3665 | 3670 |     |     |     |      | 3675 |     |     |     |      | 3680 |     |     |     |     |
| Leu  | Ser  | Ser | Asn | Lys | Leu  | Gln  | Asn | Leu | Ala | His  | Arg  | Val | Ile | Thr | Ala |
| 3685 |      |     |     |     | 3690 |      |     |     |     | 3695 |      |     |     |     |     |
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| 3700 |      |     |     |     | 3705 |      |     |     |     | 3710 |      |     |     |     |     |
| Leu  | Leu  | Val | Thr | Gln | Ser  | Lys  | Gly | Val | Ile | Gly  | Tyr  | Gly | Asn | Thr | Ser |
| 3715 |      |     |     |     | 3720 |      |     |     |     | 3725 |      |     |     |     |     |
| Ser  | Phe  | Lys | Thr | Gly | Asn  | Leu  | Ile | Tyr | Ile | Arg  | Pro  | Tyr | Ala | Leu | Ser |
| 3730 |      |     |     |     | 3735 |      |     |     |     | 3740 |      |     |     |     |     |
| Ile  | Leu  | Val | Gln | Pro | Ser  | Asp  | Gly | Glu | Val | Gly  | Asn  | Glu | Leu | Pro | Val |
| 3745 | 3750 |     |     |     |      | 3755 |     |     |     |      | 3760 |     |     |     |     |
| Gln  | Pro  | Gln | Leu | Val | Phe  | Leu  | Asp | Glu | Gln | Asn  | Arg  | Arg | Val | Glu | Ser |
| 3765 |      |     |     |     | 3770 |      |     |     |     | 3775 |      |     |     |     |     |
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| 3780 |      |     |     |     | 3785 |      |     |     |     | 3790 |      |     |     |     |     |
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| 3810 |      |     |     |     | 3815 |      |     |     |     | 3820 |      |     |     |     |     |
| Trp  | His  | Phe | Ile | Phe | Thr  | Val  | Thr | Ser | Pro | Pro  | Gly  | Val | Asn | Phe | Thr |
| 3825 | 3830 |     |     |     |      | 3835 |     |     |     |      | 3840 |     |     |     |     |
| Ala  | Arg  | Ser | Lys | Pro | Phe  | Ala  | Val | Leu | Pro | Val  | Thr  | Arg | Lys | Glu | Lys |
| 3845 |      |     |     |     | 3850 |      |     |     |     | 3855 |      |     |     |     |     |
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| 3860 |      |     |     |     | 3865 |      |     |     |     | 3870 |      |     |     |     |     |
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 Ile His Ile His Ile Ser Ser Lys Arg Arg Glu Ser Gln Gly Pro Lys  
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 Arg Lys Val Ser Arg His Ile Val Arg Glu Glu Glu Ala Ala Val Pro  
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&lt;211&gt; 12918

&lt;212&gt; DNA

&lt;213&gt; Mus musculus

&lt;400&gt; 4

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&lt;210&gt; 5

&lt;211&gt; 2416

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 5

|             |            |            |            |            |             |      |
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| aggaacactt  | gctgaatcca | cttgaaaata | ctagaattcc | tttcttaaat | ccaagtagcc  | 720  |
| tccacactta  | ccctatctgg | taatgactcg | ggggcaggta | catagattgt | ttgttttccc  | 780  |
| aacttttagt  | atagtgttta | gcacgtagtg | ggcatacaat | aaatgtttgc | agtgttgaat  | 840  |
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<223> Xaa = Arg or Gln

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Leu Ala Gly Gly Thr Trp Ile Thr Val Val Phe Asp Gly Leu Asp Arg
35          40          45
Ser Ile Leu Tyr Pro Asn Asn Gly Ser Gln Leu Gln Ile Asp Leu Val
50          55          60
Ser Val Ala Ile Pro Thr Leu Arg Ile Pro Cys Asp Val Ser Pro Ala
65          70          75          80
Phe Val Asp Leu Pro Val Val Thr Cys Gln Thr Arg Ser Leu Pro Ser
85          90          95
Glu Ala Asp Ala Gly Pro Tyr Ser Leu Glu Met Arg Ser Gly Glu Gln
100         105         110
Val Leu Gly Thr Pro Cys Pro Gly Ser Leu Asp Ser Cys Thr Phe Lys
115         120         125

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Ser | Arg | Asp | Gln | Thr | Pro | Val | Leu | Tyr | Gln | Val | Tyr | Pro | Ala | Ser | 130 | 135 | 140 |
| Gly | Val | Pro | Gly | Glu | Val | Val | Ser | Val | Tyr | Gly | Arg | Val | Ile | Thr | Thr | 145 | 150 | 155 |
| Trp | Leu | Glu | Thr | Phe | Asp | Pro | Asp | Val | Asp | Tyr | Ile | Glu | Ser | Pro | Leu | 165 | 170 | 175 |
| Ile | Leu | Glu | Ala | Arg | Glu | Asp | Lys | Trp | Leu | Thr | Pro | Cys | Ser | Leu | Ile | 180 | 185 | 190 |
| Asn | Arg | Gln | Thr | Gly | Ser | Cys | Phe | Pro | Ile | Gln | Glu | Glu | His | Gly | Leu | 195 | 200 | 205 |
| Gly | Asn | Val | Gln | Cys | Arg | Val | Glu | Gly | Asp | Tyr | Ile | Gly | Ser | Gln | Asn | 210 | 215 | 220 |
| Val | Ser | Phe | Ser | Val | Phe | Asn | Lys | Gly | Arg | Ser | Met | Val | His | Lys | Glu | 225 | 230 | 235 |
| Ala | Trp | Leu | Ile | Ser | Ala | Lys | Gln | Glu | Leu | Phe | Leu | Tyr | Gln | Thr | Tyr | 245 | 250 | 255 |
| Pro | Glu | Ile | Leu | Ser | Val | Phe | Pro | Lys | Val | Gly | Ser | Leu | Gly | Gly | Arg | 260 | 265 | 270 |
| Thr | Asp | Ile | Ile | Ile | Thr | Gly | Asp | Phe | Phe | Asp | Pro | Ser | Ala | Arg | Val | 275 | 280 | 285 |
| Thr | Ile | Ala | Gly | Ile | Pro | Cys | Asp | Ile | Arg | Tyr | Val | Ser | Pro | Arg | Lys | 290 | 295 | 300 |
| Ile | Glu | Cys | Thr | Thr | Arg | Ala | Pro | Gly | Asn | Glu | Ala | Arg | Leu | Thr | Ala | 305 | 310 | 315 |
| Pro | Gln | Ala | Gly | Asn | Arg | Gly | Leu | Arg | Phe | Glu | Val | Gly | Asp | Ala | Thr | 325 | 330 | 335 |
| Lys | Asp | Val | Glu | Leu | Thr | Glu | Ala | Thr | Pro | Gly | Tyr | Arg | Trp | Gln | Ile | 340 | 345 | 350 |
| Val | Pro | Asn | Ala | Ser | Ser | Pro | Ser | Gly | Phe | Trp | Ser | Lys | Glu | Gly | Arg | 355 | 360 | 365 |
| Pro | Phe | Arg | Ala | Arg | Leu | Ser | Gly | Phe | Phe | Val | Ala | Pro | Gln | Thr | Asn | 370 | 375 | 380 |
| Asn | Tyr | Thr | Phe | Trp | Ile | Gln | Ala | Asp | Ser | Gln | Ala | Ser | Leu | Cys | Phe | 385 | 390 | 395 |
| Ser | Ser | Ser | Glu | Glu | Pro | Arg | Thr | Lys | Val | Glu | Val | Ala | Ser | Val | Gly | 405 | 410 | 415 |
| Val | Gly | Thr | Ala | Asp | Trp | Phe | Asp | Ser | Trp | Glu | Gln | Ile | Gly | Asn | Glu | 420 | 425 | 430 |
| Gly | Ser | Trp | His | Gln | Lys | Thr | Thr | Lys | Leu | Glu | Leu | Gln | Gly | Gly | Ala | 435 | 440 | 445 |
| Lys | Tyr | Tyr | Leu | Glu | Ala | Glu | Gln | His | Gly | Ile | Ala | Pro | Ser | Arg | Gly | 450 | 455 | 460 |
| Met | Arg | Ile | Gly | Val | Gln | Ile | His | Asn | Thr | Trp | Leu | Asn | Pro | Asp | Val | 465 | 470 | 475 |
| Val | Asn | Thr | Tyr | Leu | Leu | Glu | Lys | His | Gln | Ile | Arg | Ala | Arg | Ala | Gln | 485 | 490 | 495 |
| Arg | Leu | Pro | Glu | Ile | Gln | Val | Leu | His | Val | Ser | Gly | Lys | Gly | Asn | Phe | 500 | 505 | 510 |
| Phe | Leu | Thr | Trp | Gly | Asn | Val | Ser | Ser | Gln | Pro | Val | Pro | Ala | Asn | Ala | 515 | 520 | 525 |
| Thr | Ala | Gln | Gln | Ile | Gln | Thr | Thr | Ile | Glu | Glu | Leu | Leu | Val | Val | Lys | 530 | 535 | 540 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Asn | Leu | Ala | Pro | Phe | Ser | Ala | His | Val | Leu | Leu | Arg | Leu | Gly | Phe | 545 | 550 | 555 | 560 |
| Glu | Gln | Gly | Leu | Glu | Gly | Ser | Arg | Ser | Asp | Gly | Val | Arg | Thr | Ser | Ser | 565 | 570 | 575 |     |
| Thr | Glu | Pro | Phe | Cys | Gly | Arg | Phe | Ser | Leu | Gly | Gln | Leu | Gly | His | Leu | 580 | 585 | 590 |     |
| Ile | Leu | Ile | Pro | Glu | Ala | Ala | Asp | Lys | Gly | Tyr | Gln | Leu | Asp | Arg | Tyr | 595 | 600 | 605 |     |
| Pro | Tyr | Leu | Cys | Leu | Ala | Tyr | Arg | Gly | His | Met | Asn | Lys | Thr | Leu | Asp | 610 | 615 | 620 |     |
| Met | Thr | Val | Ser | Phe | Leu | Phe | Gly | Phe | Gln | Thr | Ile | Met | Lys | Asn | Ile | 625 | 630 | 635 | 640 |
| Thr | Cys | Asp | Trp | Ser | Leu | Thr | Asp | Pro | His | Pro | Glu | Ser | Trp | Gln | Phe | 645 | 650 | 655 |     |
| Thr | Cys | Ile | Asn | Leu | Trp | Asp | Thr | Cys | Leu | Cys | His | Ser | Glu | Asp | Ile | 660 | 665 | 670 |     |
| Gln | Ser | Ser | Leu | Ala | Asn | Thr | Pro | Leu | Leu | Ala | His | Arg | Ile | Asp | Ile | 675 | 680 | 685 |     |
| Arg | Pro | Val | Val | Pro | Glu | Ala | Gly | Leu | Leu | Tyr | Val | Asp | Glu | Ile | Ile | 690 | 695 | 700 |     |
| Leu | Ala | Asp | Thr | Asn | Val | Thr | Val | Ser | Gln | Ala | Asp | Ser | Gly | Arg | Ala | 705 | 710 | 715 | 720 |
| Cys | Pro | Gly | Gly | Asn | Val | Val | Glu | Ser | Val | Ser | Val | Val | Gly | Val | Pro | 725 | 730 | 735 |     |
| Pro | Val | Tyr | Ser | Ile | Ser | Ser | Trp | Leu | Ala | Gly | Cys | Gly | Ser | Glu | Leu | 740 | 745 | 750 |     |
| Pro | Leu | Ile | Thr | Ala | Cys | Ser | Val | Ser | Thr | Glu | Gly | Thr | Gly | Asp | Gly | 755 | 760 | 765 |     |
| Ser | Glu | Leu | Ile | Glu | Val | Thr | Ala | Gln | Arg | Leu | Gln | Arg | Thr | Ser | Pro | 770 | 775 | 780 |     |
| Pro | Leu | Gly | Gly | His | Phe | Phe | Leu | Tyr | Leu | Ser | Asp | Thr | Val | Ile | Pro | 785 | 790 | 795 | 800 |
| Asp | Val | Pro | Val | Arg | Met | Ser | Ala | Arg | Gln | Leu | His | Lys | Leu | Leu | Gln | 805 | 810 | 815 |     |
| Asp | Ser | Ala | Asp | Glu | Ser | Thr | Ser | Gly | Tyr | Leu | Asn | Ala | Gly | Asp | Phe | 820 | 825 | 830 |     |
| Thr | Val | Thr | Glu | Asp | Leu | Asn | Ser | Cys | Tyr | Glu | His | Val | Trp | Thr | Leu | 835 | 840 | 845 |     |
| Ser | Trp | Thr | Thr | Gln | Thr | Gly | Asp | Leu | Pro | Asn | Phe | Ile | Arg | Val | Ser | 850 | 855 | 860 |     |
| Asp | Gln | Asn | Leu | Thr | Gly | Val | Asn | Pro | Thr | Val | Thr | Ala | Arg | Val | Val | 865 | 870 | 875 | 880 |
| Tyr | Asp | Gly | Gly | Val | Phe | Leu | Gly | Pro | Ile | Phe | Gly | Asp | Met | Leu | Ala | 885 | 890 | 895 |     |
| Thr | Ala | Asn | Gln | Gln | Thr | Gln | Val | Ala | Val | Gln | Val | Asn | Asp | Ile | Pro | 900 | 905 | 910 |     |
| Ala | Tyr | Cys | Ser | Gly | Ser | Cys | Ser | Phe | Gln | Tyr | Gln | Gln | Glu | Ser | Thr | 915 | 920 | 925 |     |
| Pro | Ser | Val | Asp | His | Val | Trp | Tyr | Ser | Leu | Gly | Ser | Asp | Val | Asn | Leu | 930 | 935 | 940 |     |
| Leu | Val | His | Phe | Thr | Gly | Thr | Gly | Phe | Pro | Arg | Asp | Thr | Gln | Phe | Leu | 945 | 950 | 955 | 960 |

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 Phe Gln Gly Lys Ala Arg Ile Lys Ile Tyr Gly Ser Val His Ser Thr  
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|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Trp  | Met  | Asn  | Arg  | Ser  | Leu  | Gln  | Tyr  | Ser  | Ala  | Thr  | Phe  | Asp  | Ser  | Phe  | Ala  |
| 2625 |      |      |      |      | 2630 |      |      |      | 2635 |      |      |      |      |      | 2640 |
| Pro  | Gly  | Asn  | Tyr  | Leu  | Leu  | Ile  | Met  | His  | Arg  | Asp  | Leu  | Pro  | Pro  | Tyr  | Pro  |
|      |      |      |      | 2645 |      |      |      |      | 2650 |      |      |      |      | 2655 |      |
| Asp  | Ile  | Leu  | Leu  | Arg  | Cys  | Gly  | Ser  | Gln  | Val  | Gly  | His  | Ser  | Leu  | Pro  | Phe  |
|      |      |      | 2660 |      |      |      |      | 2665 |      |      |      |      | 2670 |      |      |
| His  | Pro  | Leu  | Pro  | Ser  | Gln  | Asp  | Arg  | Ala  | Cys  | Asp  | Trp  | Phe  | Phe  | Asn  | Arg  |
|      |      | 2675 |      |      |      |      | 2680 |      |      |      |      | 2685 |      |      |      |
| Gln  | Leu  | Arg  | Gln  | Leu  | Thr  | Tyr  | Leu  | Val  | Ser  | Gly  | Glu  | Gly  | Gln  | Val  | Lys  |
|      | 2690 |      |      |      |      | 2695 |      |      |      |      | 2700 |      |      |      |      |
| Val  | Phe  | Leu  | Gln  | Leu  | Lys  | Pro  | Gly  | Val  | Pro  | Pro  | Ser  | Val  | Ser  | Ala  | Ser  |
| 2705 |      |      |      |      | 2710 |      |      |      |      | 2715 |      |      |      |      | 2720 |
| Thr  | Ser  | Val  | Pro  | Glu  | Ser  | Ala  | Ser  | Arg  | Trp  | Ser  | Leu  | Pro  | Glu  | Thr  | Trp  |
|      |      |      |      | 2725 |      |      |      |      | 2730 |      |      |      |      | 2735 |      |
| Gln  | Asp  | Val  | Glu  | Lys  | Gly  | Trp  | Gly  | Gly  | Tyr  | Asn  | His  | Thr  | Ile  | Pro  | Gly  |
|      |      | 2740 |      |      |      |      | 2745 |      |      |      |      |      | 2750 |      |      |
| Pro  | Gly  | Asp  | Asp  | Val  | Leu  | Ile  | Leu  | Pro  | Asn  | Lys  | Thr  | Val  | Leu  | Val  | Asp  |
|      |      | 2755 |      |      |      |      | 2760 |      |      |      |      | 2765 |      |      |      |
| Thr  | Asp  | Leu  | Pro  | Val  | Leu  | Arg  | Cys  | Leu  | Tyr  | Val  | Met  | Gly  | Thr  | Leu  | Glu  |
|      | 2770 |      |      |      |      | 2775 |      |      |      |      | 2780 |      |      |      |      |
| Phe  | Pro  | Val  | Asp  | Arg  | Ser  | Asn  | Val  | Leu  | Ser  | Val  | Ala  | Cys  | Leu  | Leu  | Ile  |
| 2785 |      |      |      |      | 2790 |      |      |      |      | 2795 |      |      |      |      | 2800 |
| Ala  | Gly  | Gly  | Glu  | Leu  | Lys  | Val  | Gly  | Thr  | Leu  | Glu  | Asn  | Pro  | Leu  | Glu  | Lys  |
|      |      |      |      | 2805 |      |      |      |      | 2810 |      |      |      |      | 2815 |      |
| Asp  | Gln  | Arg  | Leu  | Leu  | Ile  | Phe  | Leu  | Arg  | Ala  | Ser  | Glu  | Glu  | Val  | Val  | Cys  |
|      |      |      | 2820 |      |      |      |      | 2825 |      |      |      |      | 2830 |      |      |
| Asp  | Tyr  | Phe  | Glu  | Gly  | Ile  | His  | Val  | Asp  | Pro  | Gly  | Thr  | Ile  | Gly  | Val  | Tyr  |
|      |      | 2835 |      |      |      |      | 2840 |      |      |      |      | 2845 |      |      |      |
| Gly  | Lys  | Leu  | Arg  | Leu  | His  | Ser  | Ala  | Tyr  | Pro  | Lys  | Lys  | Ser  | Trp  | Val  | His  |
|      | 2850 |      |      |      |      | 2855 |      |      |      |      | 2860 |      |      |      |      |
| Leu  | Gly  | Ala  | Asp  | Ile  | Ala  | Pro  | Gly  | Asn  | Glu  | Arg  | Ile  | Ile  | Val  | His  | Asn  |
| 2865 |      |      |      |      | 2870 |      |      |      |      | 2875 |      |      |      |      | 2880 |
| Ala  | Val  | Asp  | Trp  | Gln  | Pro  | His  | Asp  | Thr  | Ile  | Val  | Leu  | Ser  | Ser  | Ser  | Ser  |
|      |      |      |      | 2885 |      |      |      |      | 2890 |      |      |      |      | 2895 |      |
| Tyr  | Glu  | Ala  | His  | Glu  | Ala  | Glu  | Val  | Leu  | Thr  | Val  | Lys  | Glu  | Val  | Lys  | Gly  |
|      |      |      | 2900 |      |      |      |      | 2905 |      |      |      |      | 2910 |      |      |
| His  | His  | Ile  | Arg  | Ile  | Tyr  | Glu  | Arg  | Leu  | Lys  | His  | Arg  | His  | Ile  | Gly  | Ser  |
|      |      | 2915 |      |      |      |      | 2920 |      |      |      |      | 2925 |      |      |      |
| Thr  | His  | Thr  | Met  | Glu  | Asp  | Gly  | Gln  | Gln  | Val  | His  | Leu  | Ala  | Ala  | Glu  | Val  |
|      | 2930 |      |      |      |      | 2935 |      |      |      |      | 2940 |      |      |      |      |
| Gly  | Leu  | Leu  | Thr  | Arg  | Asn  | Ile  | Arg  | Ile  | Gln  | Pro  | Asp  | Ser  | Ser  | Cys  | Arg  |
| 2945 |      |      |      |      | 2950 |      |      |      |      | 2955 |      |      |      |      | 2960 |
| Gly  | Arg  | Leu  | Leu  | Val  | Gly  | Ser  | Phe  | Arg  | Lys  | Ser  | Ser  | Gly  | Glu  | Asp  | Phe  |
|      |      |      |      | 2965 |      |      |      |      |      |      |      |      |      |      |      |



Asn Gly His Gly Ile Asp Val Glu Gly Gln Asn Tyr Ser Leu Thr Asn  
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 Asn Leu Val Ile Leu Thr Met Gln Ser Ala Asn Ser Ser Pro Trp Val  
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 Ala Gly Ile Lys Val Asn Tyr Ala Glu Asp Ile Ile Leu His Gly Asn  
 3075 3080 3085  
 Val Val Ala Gly Ser Glu Arg Leu Gly Phe His Val Gly Gly His Gly  
 3090 3095 3100  
 Cys Ser Ser Glu Val Leu Trp Ser Asp Asn Val Val His Ser Ser Leu  
 3105 3110 3115 3120  
 His Gly Leu His Leu Tyr Lys Lys His Glu Ser Asn Asn Cys Thr Gly  
 3125 3130 3135  
 Val Ser Gly Phe Met Ala Phe Lys Asn Phe Asp Tyr Gly Ala Met Val  
 3140 3145 3150  
 Gln Thr Glu Asn Ser Val Asp Ile Gln Asn Ile Thr Leu Val Asp Asn  
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 Thr Val Gly Leu Leu Ala Ile Thr Tyr Val Ser Ser Ala Leu Leu Ser  
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 Ser Val Ser Thr Val Gln Ile Thr Leu Arg Asn Ser Val Ile Val Ala  
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 Thr Ser Ser Ser Phe Asp Cys Ile His Asp Arg Lys Ala Pro Gln Ser  
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 Ala Asn Trp Thr Ser Thr Asp Arg Ala Pro Ser Asn Pro Arg Gly Gly  
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 Arg Ile Gly Ile Leu Trp Pro Val Ser Ala Ser Glu Pro Asn Ala Trp  
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 Pro Gln Glu Pro Trp His Lys Val Arg Ser Arg His Ser Val Pro Gly  
 3250 3255 3260  
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 Tyr Ser Asn Asp Leu Asp Val Cys Ile Leu Pro Asn Glu Tyr Ser Thr  
 3285 3290 3295  
 Gly Val Met Tyr Pro Ile Thr Ala Glu Arg Thr Arg Met Leu Gly Ile  
 3300 3305 3310  
 Lys Asp Lys Asn Lys Phe Tyr Phe Pro Val Leu Gln Ser Ser Lys Asp  
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 3330 3335 3340  
 Tyr Leu Phe Thr Asp Leu Asp Gly Arg Thr Leu Gly Leu Pro Pro Pro  
 3345 3350 3355 3360  
 Val Ser Val Phe Pro Arg Thr Glu Glu Glu Trp Thr Gly Ser Phe Leu  
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 Asn Thr Gly Ile Phe Arg Glu Glu Gln Lys Cys Thr Phe Arg Ala Met  
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 Asp Asn Val Asp Ala Thr Trp Thr Ile Pro Lys Ser His Pro Leu Val  
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 Ser Val Thr Asn Gly Phe Val Asp Thr Phe Ser Ile Val Lys Asp Ser  
 3425 3430 3435 3440  
 Asp Leu Cys Pro Pro Thr Ser Ser Leu Ser Thr Phe Tyr Ser Ile Leu  
 3445 3450 3455

Pro Thr Arg Gln Met Thr Lys Val Cys Phe Pro Glu Gln Thr Pro Pro  
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 Phe Leu Arg Phe Leu Leu Leu Gly Asn Gln Arg Ala Ser Lys Leu Ile  
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 Leu Ala Val Phe Tyr Asn Glu Ile Gln Ser Pro His Val Phe Leu Asp  
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 Tyr Val Val Leu Gln Gly Glu Glu Pro Val Glu Ile His Ser Ser Val  
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 Glu Thr Phe Ser Lys Val Ile Val Ile Glu Val Gly Asp Leu Pro Asn  
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 Arg Leu Val Asn Gln Val Ile Thr Ala Gln Gln Thr Gly Ala Leu Glu  
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 Asn Val Leu Gly Met Thr Val Gly Ala Leu Leu Val Thr Gln Ser Lys  
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 Gly Val Thr Gly Tyr Arg Asn Ala Ser Ser Leu Ile Thr Gly Asn Leu  
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 Ile Tyr Thr Arg Pro Ser Glu Leu Ser Ile Leu Val Gln Pro Ser Asp  
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 Gly Glu Val Gly Ile Glu Leu Pro Val Gln Pro Arg Leu Val Phe Leu  
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 Asp Glu Lys Asn Glu Arg Val Glu Ser Leu Gly Leu Pro Ser Glu Pro  
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 Trp Ile Ile Ser Val Ser Leu Glu Gly Ala Ser Glu Ser Val Leu Lys  
 3780 3785 3790  
 Gly Cys Thr Leu Ala Glu Thr Arg Asp Gly Tyr Val Thr Phe Ser Arg  
 3795 3800 3805  
 Leu Ala Val Leu Ile Ser Gly Ser Asn Trp His Leu Phe Phe Thr Val  
 3810 3815 3820  
 Ile Ser Pro Pro Gly Thr Asn Phe Thr Ala Arg Ser Arg Thr Phe Val  
 3825 3830 3835 3840  
 Val Leu Pro Val Ala Ser Lys Glu Arg Ser Thr Ile Ile Leu Ala Leu  
 3845 3850 3855  
 Ser Leu Cys Ser Val Ala Ser Trp Val Ala Leu Ser Cys Leu Val Cys  
 3860 3865 3870

Cys Trp Phe Lys Lys Ser Lys Thr Arg Lys Ile Lys Pro Glu Asp Ile  
 3875 3880 3885  
 Ser Glu Ser Gln Ala Lys Glu Gln Lys Lys Asn Thr His Asn Ser Ser  
 3890 3895 3900  
 Lys Pro Arg Gly Leu Gln Ala Lys Thr Ala Lys Glu Asn Thr Leu Met  
 3905 3910 3915 3920  
 Gly Glu Asp Met Arg Met Lys Val Met Gln Gly Met Gln Ser Gln Phe  
 3925 3930 3935  
 Pro Gln His Ser Met Asp Gly Val Ser Lys Arg Lys Val Ser Arg Leu  
 3940 3945 3950  
 Ala Val Thr Gly Glu Arg Thr Ala Thr Pro Ala Pro Lys Ile Pro Arg  
 3955 3960 3965  
 Ile Thr Cys Val Pro Gly Ser Leu Ala Gln Gln Leu Thr Leu Gln Glu  
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 Pro Gly Asn Trp Gln Glu Ala Gln Gln Gln Leu Leu Arg Tyr Gln Leu  
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 Arg Lys Gln Gly Gln Glu Pro Ser Gln Leu Asp Lys Gly Ser Asp Cys  
 4020 4025 4030  
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 Gly Leu His Thr Thr Pro Pro Glu Thr Ile Gln  
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<210> 7

<211> 4051

<212> PRT

<213> Rattus norvegicus

<400> 7

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 Ala Gly Gly Thr Trp Ile Thr Leu Val Phe Asp Gly Leu Glu Thr Ser  
 35 40 45  
 Ile Leu Tyr Pro Asn Asn Gly Ser Gln Leu Ala Ile Asp Leu Val Asn  
 50 55 60  
 Val Ala Thr Pro Ala Leu Lys Ile Pro Cys Asp Ile Ser Pro Leu Phe  
 65 70 75 80  
 Val Asp Leu Pro Val Val Thr Cys Gln Thr Arg Ser Leu Pro Ser Glu  
 85 90 95  
 Ala Pro Glu Gly Leu Tyr Ser Leu Glu Ile Arg Ser Gly Asp Gln Leu  
 100 105 110  
 Leu Gly Ser Pro Cys Ala Arg Leu Leu Asp Asn Cys Thr Phe Lys Phe  
 115 120 125  
 Ser Lys Glu Gln Thr Pro Val Leu Tyr Gln Val Asn Pro Ser Ser Gly  
 130 135 140  
 Val Pro Gly Glu Val Val His Val Tyr Gly Trp Val Ile Thr Asp Arg  
 145 150 155 160  
 Met Glu Ile Phe Asp Pro Asp Val Asp Tyr Met Glu Ser Pro Leu Ile

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| 165 |     |     |     |     |     |     |     | 170 |     |     |     |     | 175 |     |     |  |
| Leu | Glu | Ala | Gly | Gly | Asp | Lys | Trp | Leu | Thr | Pro | Cys | Ser | Leu | Ile | Asn |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     | 190 |     |     |     |     |  |
| Arg | Lys | Thr | Gly | Ile | Cys | Phe | Pro | Ile | Gln | Glu | Glu | His | Gly | Leu | Gly |  |
|     |     |     | 195 |     |     |     |     | 200 |     |     | 205 |     |     |     |     |  |
| Thr | Val | Gln | Cys | Arg | Val | Glu | Gly | Ser | Tyr | Ile | Gly | Ser | Gln | Asn | Val |  |
|     |     |     | 210 |     |     |     |     | 215 |     |     | 220 |     |     |     |     |  |
| Ser | Phe | Ser | Val | Phe | Asn | Lys | Gly | Arg | Ser | Met | Val | His | Lys | Glu | Ala |  |
| 225 |     |     |     |     |     |     |     | 230 |     |     | 235 |     |     |     | 240 |  |
| Trp | Leu | Ile | Ser | Ala | Lys | Gln | Glu | Leu | Phe | Leu | Tyr | Gln | Thr | Tyr | Pro |  |
|     |     |     | 245 |     |     |     | 250 |     |     | 255 |     |     |     |     |     |  |
| Glu | Ile | His | Ser | Val | Phe | Pro | Lys | Val | Gly | Ser | Leu | Gly | Gly | Arg | Thr |  |
|     |     |     | 260 |     |     |     | 265 |     |     | 270 |     |     |     |     |     |  |
| Asp | Ile | Thr | Ile | Thr | Gly | Asp | Phe | Asp | Pro | Ser | Ala | Arg | Val | Thr |     |  |
|     |     |     | 275 |     |     |     | 280 |     |     | 285 |     |     |     |     |     |  |
| Ile | Ala | Gly | Ile | Pro | Cys | Asp | Ile | Arg | His | Val | Ser | Pro | Lys | Lys | Ile |  |
|     |     |     | 290 |     |     |     | 295 |     |     | 300 |     |     |     |     |     |  |
| Glu | Cys | Thr | Thr | Arg | Ala | Pro | Arg | Asn | Gly | Ala | Arg | Leu | Thr | Ala | Pro |  |
| 305 |     |     |     | 310 |     |     |     | 315 |     |     | 320 |     |     |     |     |  |
| Gln | Ala | Ser | Asn | Arg | Gly | Leu | Leu | Phe | Glu | Val | Gly | Asn | Ala | Val | Lys |  |
|     |     |     | 325 |     |     |     | 330 |     |     | 335 |     |     |     |     |     |  |
| Asp | Glu | Glu | Leu | Thr | Glu | Ala | Thr | Pro | Gly | Tyr | Arg | Trp | Gln | Ile | Val |  |
|     |     |     | 340 |     |     |     | 345 |     |     | 350 |     |     |     |     |     |  |
| Pro | Asn | Ala | Ser | Ser | Pro | Ser | Gly | Phe | Trp | Ser | Lys | Glu | Gly | Arg | Pro |  |
|     |     |     | 355 |     |     |     | 360 |     |     | 365 |     |     |     |     |     |  |
| Phe | Arg | Ala | Arg | Leu | Ser | Gly | Phe | Phe | Val | Ala | Pro | Glu | Thr | Asn | Asn |  |
|     |     |     | 370 |     |     |     | 375 |     |     | 380 |     |     |     |     |     |  |
| Tyr | Thr | Phe | Trp | Ile | Gln | Ala | Asp | Ser | Gln | Ala | Phe | Leu | Arg | Phe | Ser |  |
| 385 |     |     |     | 390 |     |     |     | 395 |     |     | 400 |     |     |     |     |  |
| Ser | Ser | Glu | Glu | Pro | Arg | Met | Lys | Val | Glu | Val | Ala | Ser | Ile | Ala | Val |  |
|     |     |     | 405 |     |     |     | 410 |     |     | 415 |     |     |     |     |     |  |
| Gly | Thr | Ala | Asp | Trp | Phe | Asp | Ser | Trp | Glu | Gln | Asn | Gly | Asn | Glu | Gly |  |
|     |     |     | 420 |     |     |     | 425 |     |     | 430 |     |     |     |     |     |  |
| Ser | Trp | Gln | Gln | Lys | Thr | Asn | Lys | Leu | Glu | Leu | Gln | Gly | Gly | Ala | Lys |  |
|     |     |     | 435 |     |     |     | 440 |     |     | 445 |     |     |     |     |     |  |
| Tyr | Tyr | Leu | Glu | Ala | Glu | Gln | His | Gly | Ile | Ala | Pro | Ser | Arg | Gly | Met |  |
|     |     |     | 450 |     |     |     | 455 |     |     | 460 |     |     |     |     |     |  |
| Arg | Ile | Ala | Val | Gln | Ile | His | Asn | Thr | Trp | Leu | Asn | Pro | Asp | Val | Val |  |
| 465 |     |     |     | 470 |     |     |     | 475 |     |     | 480 |     |     |     |     |  |
| Asn | Thr | Tyr | Leu | Leu | Glu | Lys | His | Gln | Ile | Arg | Ala | Gln | Ala | Gln | Arg |  |
|     |     |     | 485 |     |     |     | 490 |     |     | 495 |     |     |     |     |     |  |
| Leu | Pro | Glu | Ile | Gln | Val | Leu | Asn | Met | Ser | Gly | Lys | Gly | Asn | Phe | Phe |  |
|     |     |     | 500 |     |     |     | 505 |     |     | 510 |     |     |     |     |     |  |
| Leu | Thr | Trp | Gly | Asn | Val | Ser | Ser | Gln | Pro | Val | Pro | Ala | Asn | Ala | Thr |  |
|     |     |     | 515 |     |     |     | 520 |     |     | 525 |     |     |     |     |     |  |
| Ala | Gln | Gln | Ile | Gln | Thr | Ile | Ile | Glu | Glu | Leu | Leu | Val | Val | Lys | Cys |  |
|     |     |     | 530 |     |     |     | 535 |     |     | 540 |     |     |     |     |     |  |
| Asn | Leu | Val | Pro | Leu | Ser | Ala | Arg | Val | Leu | Leu | Trp | Leu | Gly | Phe | Glu |  |
| 545 |     |     |     | 550 |     |     |     | 555 |     |     | 560 |     |     |     |     |  |
| Gln | Gly | Leu | Asp | Gly | Ser | Arg | Ser | Asp | Gly | Val | Leu | Thr | Ser | Ser | Thr |  |
|     |     |     | 565 |     |     |     | 570 |     |     | 575 |     |     |     |     |     |  |
| Glu | Pro | Phe | Cys | Gly | Arg | Phe | Ser | Leu | Gly | Gln | Leu | Arg | His | Leu | Ile |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| 580 |     |     |     |     |     | 585 |     |     |     |     |     | 590 |     |     |     |  |  |
| Leu | Ser | Pro | Gly | Ala | Val | Ser | Lys | Gly | Tyr | Gln | Leu | Asp | Arg | Tyr | Pro |  |  |
| 595 |     |     |     |     |     | 600 |     |     |     |     |     | 605 |     |     |     |  |  |
| Tyr | Leu | Cys | Phe | Ala | Tyr | Arg | Gly | His | Met | Asn | Arg | Thr | Leu | Asp | Met |  |  |
| 610 |     |     |     |     |     | 615 |     |     |     |     |     | 620 |     |     |     |  |  |
| Thr | Val | Ser | Phe | Leu | Phe | Gly | Phe | Gln | Asn | Val | Met | Lys | Asn | Ile | Thr |  |  |
| 625 |     |     |     |     |     | 630 |     |     |     |     |     | 635 |     |     |     |  |  |
| Cys | Asp | Trp | Ser | Leu | Met | Glu | Pro | His | Pro | Glu | Ser | Trp | His | Phe | Thr |  |  |
| 645 |     |     |     |     |     | 650 |     |     |     |     |     | 655 |     |     |     |  |  |
| Cys | Asn | Asn | Leu | Trp | Asp | Thr | Cys | Val | Arg | His | Ser | Glu | Glu | Leu | Gln |  |  |
| 660 |     |     |     |     |     | 665 |     |     |     |     |     | 670 |     |     |     |  |  |
| Ser | Ser | Leu | Ala | Asn | Thr | Pro | Leu | Leu | Val | His | Arg | Ile | Asp | Ile | Phe |  |  |
| 675 |     |     |     |     |     | 680 |     |     |     |     |     | 685 |     |     |     |  |  |
| Pro | Val | Val | Pro | Glu | Ala | Asp | Leu | Leu | Tyr | Val | Asp | Glu | Ile | Ile | Leu |  |  |
| 690 |     |     |     |     |     | 695 |     |     |     |     |     | 700 |     |     |     |  |  |
| Ala | Asp | Thr | Asn | Val | Thr | Val | Ser | Gln | Ala | Asp | Ser | Gly | Val | Ala | Arg |  |  |
| 705 |     |     |     |     |     | 710 |     |     |     |     |     | 715 |     |     |     |  |  |
| Pro | Gly | Gly | Asn | Val | Val | Glu | Ser | Val | Ser | Val | Val | Gly | Val | Pro | Pro |  |  |
| 725 |     |     |     |     |     | 730 |     |     |     |     |     | 735 |     |     |     |  |  |
| Val | Tyr | Ser | Ile | Ala | Ser | Trp | Met | Ala | Gly | Cys | Gly | Ser | Glu | Leu | Pro |  |  |
| 740 |     |     |     |     |     | 745 |     |     |     |     |     | 750 |     |     |     |  |  |
| Leu | Ile | Thr | Ala | Cys | Tyr | Val | Pro | Thr | Gln | Gly | Thr | Gly | Glu | Gly | Ser |  |  |
| 755 |     |     |     |     |     | 760 |     |     |     |     |     | 765 |     |     |     |  |  |
| Glu | Leu | Ile | Glu | Val | Thr | Ala | Lys | Arg | Leu | Gln | Arg | Thr | Ser | Pro | Pro |  |  |
| 770 |     |     |     |     |     | 775 |     |     |     |     |     | 780 |     |     |     |  |  |
| Leu | Gly | Gly | His | Phe | Ser | Leu | His | Leu | Ser | Asp | Thr | Val | Ile | Pro | Asp |  |  |
| 785 |     |     |     |     |     | 790 |     |     |     |     |     | 795 |     |     |     |  |  |
| Val | Pro | Val | His | Val | Ser | Ala | Arg | Gln | Leu | His | Lys | Leu | Leu | Gln | Asp |  |  |
| 805 |     |     |     |     |     | 810 |     |     |     |     |     | 815 |     |     |     |  |  |
| Asn | Ala | Asp | Glu | Ser | Thr | Ser | Gly | Tyr | Leu | Asn | Ala | Asp | Asp | Phe | Ile |  |  |
| 820 |     |     |     |     |     | 825 |     |     |     |     |     | 830 |     |     |     |  |  |
| Val | Thr | Lys | Asp | Gln | Asn | Ser | Cys | Tyr | Glu | His | Val | Trp | Thr | Leu | Ser |  |  |
| 835 |     |     |     |     |     | 840 |     |     |     |     |     | 845 |     |     |     |  |  |
| Trp | Thr | Thr | Gln | Ile | Gly | Asp | Leu | Pro | Asn | Phe | Ile | Arg | Val | Ser | Asp |  |  |
| 850 |     |     |     |     |     | 855 |     |     |     |     |     | 860 |     |     |     |  |  |
| Gln | Asn | Leu | Thr | Gly | Leu | Asn | Pro | Thr | Ile | Thr | Ala | Arg | Val | Val | Tyr |  |  |
| 865 |     |     |     |     |     | 870 |     |     |     |     |     | 875 |     |     |     |  |  |
| Asp | Gly | Gly | Val | Phe | Leu | Gly | Pro | Ile | Leu | Gly | Asp | Thr | Leu | Ala | Thr |  |  |
| 885 |     |     |     |     |     | 890 |     |     |     |     |     | 895 |     |     |     |  |  |
| Ala | Asn | Gln | Gln | Thr | Gln | Val | Thr | Val | Gln | Val | Asn | Asp | Ile | Pro | Ala |  |  |
| 900 |     |     |     |     |     | 905 |     |     |     |     |     | 910 |     |     |     |  |  |
| His | Cys | Ser | Gly | Ser | Cys | Ser | Phe | Gln | Tyr | Gln | Arg | Ala | Ser | Thr | Pro |  |  |
| 915 |     |     |     |     |     | 920 |     |     |     |     |     | 925 |     |     |     |  |  |
| Ser | Val | Asp | Cys | Val | Trp | Tyr | Ser | Leu | Gly | Ser | Asp | Val | Asn | Leu | Leu |  |  |
| 930 |     |     |     |     |     | 935 |     |     |     |     |     | 940 |     |     |     |  |  |
| Val | His | Phe | Thr | Gly | Asn | Gly | Phe | Pro | Arg | Asp | Ala | Gln | Phe | Leu | Gln |  |  |
| 945 |     |     |     |     |     | 950 |     |     |     |     |     | 955 |     |     |     |  |  |
| Val | Thr | Val | Ile | Asn | Thr | Ser | Cys | Glu | Val | Ile | Phe | Ser | Asn | Glu | Thr |  |  |
| 965 |     |     |     |     |     | 970 |     |     |     |     |     | 975 |     |     |     |  |  |
| Asn | Val | Ala | Cys | Glu | Leu | Ala | Leu | Leu | Pro | Val | Gly | Val | His | Arg | Val |  |  |
| 980 |     |     |     |     |     | 985 |     |     |     |     |     | 990 |     |     |     |  |  |
| Phe | Met | Leu | Val | Arg | Pro | Ser | Gly | Leu | Ala | Leu | Asn | Ala | Ser | Gly | Gly |  |  |

|   |      |      |
|---|------|------|
| 995   | 1000 | 1005 |
| Gly Leu Phe Leu Arg Val Glu Pro Arg Leu Asp Ala Val Glu Pro Ser |      |      |
| 1010  | 1015 | 1020 |
| Thr Gly Ala Glu Ile Gly Gly Trp Trp Val Thr Leu Arg Gly Ser Ser |      |      |
| 1025  | 1030 | 1035 |
| Leu Glu Gly Val Ser Leu Val Leu Phe Gly Thr Arg Ser Cys Val Ile |      | 1040 |
| 1045  | 1050 | 1055 |
| Asp Val Ile Arg Ser Asn Ser Gln Gln Ile Gln Cys Lys Val Pro Pro |      |      |
| 1060  | 1065 | 1070 |
| Arg Gly Lys Asp Gly Tyr Thr Val Asn Val Thr Val Ile Asn Gly Asp |      |      |
| 1075  | 1080 | 1085 |
| His Ser Thr Val Leu Ala Arg Ala Phe Thr Tyr Val Ser Ser Leu Asn |      |      |
| 1090  | 1095 | 1100 |
| Pro Val Ile Val Ser Leu Ser Arg Asn Arg Ser Asn Ile Ala Gly Gly |      |      |
| 1105  | 1110 | 1115 |
| Glu Ile Leu Phe Leu Gly Met Thr Leu Met Val Asn Tyr Thr Asp Leu |      | 1120 |
| 1125  | 1130 | 1135 |
| Asn Val Gln Ile Tyr Ile Gln Asn Thr Ser Ala Gln Val Leu Ala Lys |      |      |
| 1140  | 1145 | 1150 |
| Thr Ala Trp Gly Leu Glu Val Leu Leu Pro Pro Leu Leu Pro Gly Ile |      |      |
| 1155  | 1160 | 1165 |
| Tyr Val Ile Ser Ala Phe Ile Asn Gly Ile Ser Ile Arg Ser Gln Gly |      |      |
| 1170  | 1175 | 1180 |
| Val Asp Leu His Ile Gln Tyr Leu Thr Glu Val Phe Ser Met Glu Pro |      |      |
| 1185  | 1190 | 1195 |
| Cys Ser Gly Ser Leu Leu Gly Gly Thr Ile Leu Arg Leu Ser Gly Ala |      | 1200 |
| 1205  | 1210 | 1215 |
| Gly Leu Gly Arg Asp Pro Ala Leu Ile Arg Val Leu Val Asp Asn Arg |      |      |
| 1220  | 1225 | 1230 |
| Pro Cys Asp Thr Val Lys Leu Thr Glu Val Asn Ile Trp Cys Glu Thr |      |      |
| 1235  | 1240 | 1245 |
| Pro Arg Val Leu Leu Pro Pro Arg Ala Asp Val Leu Thr Val Pro Ala |      |      |
| 1250  | 1255 | 1260 |
| Ser Val Glu Ile Trp Ala Gly Asn Thr Ser Phe Val Gly Lys Ala Phe |      |      |
| 1265  | 1270 | 1275 |
| Ile Phe Thr Tyr Glu Ala Ala Ala Thr Pro Val Val Thr Ala Met Trp |      | 1280 |
| 1285  | 1290 | 1295 |
| Gly Glu Leu Met Asn Asn Ser Val Arg Phe Tyr Val Glu Gly Asn Asn |      |      |
| 1300  | 1305 | 1310 |
| Leu Ser Asp Ser Val Ile Leu Leu Gly Ser Leu Lys Cys Asp Leu Gln |      |      |
| 1315  | 1320 | 1325 |
| Val Gln Leu Phe Gly Asp Asn Met Asn Leu Ser Gly Cys Ser Leu Leu |      |      |
| 1330  | 1335 | 1340 |
| Leu His Ser Leu Glu Ala Gly Val Tyr Ala Leu Gln Val Arg His Lys |      |      |
| 1345  | 1350 | 1355 |
| Arg Met Gly Phe Ala Asn Met Ser Ala Val Pro Gln Lys Phe Glu Leu |      | 1360 |
| 1365  | 1370 | 1375 |
| Ser Pro Gln Ile Ile Asp Ile Phe Pro Thr His Gly Ser Ile Tyr Gly |      |      |
| 1380  | 1385 | 1390 |
| Gly Thr Val Leu Thr Val Lys Gly Thr Ala Phe Arg Ser Arg Arg Arg |      |      |
| 1395  | 1400 | 1405 |
| Ser Val His Val Asp Leu Ser Gly Pro Phe Thr Cys Val Ile Leu Ser |      |      |

|   |      |      |
|---|------|------|
| 1410  | 1415 | 1420 |
| Leu Gly Asp His Thr Val Leu Cys Gln Thr Lys Phe Val Gly Asp Gln |      |      |
| 1425  | 1430 | 1435 |
| Phe Ser Glu Thr Ser Leu Ala Leu Asn Ile Thr Val Leu Val Asn Gly |      | 1440 |
| 1445  | 1450 | 1455 |
| Leu Thr Ser Lys Cys Glu Gly Asn Cys Thr Leu Phe Leu Glu Glu Ala |      |      |
| 1460  | 1465 | 1470 |
| Ala Thr Pro Ile Val Asp Ala Leu Thr Ile Ser Ile Ser Gly Ser Leu |      |      |
| 1475  | 1480 | 1485 |
| Thr Thr Val Leu Met Arg Gly Gln Arg Leu Gly Ser Ala Gly Glu Pro |      |      |
| 1490  | 1495 | 1500 |
| Thr Ala Phe Val Asp Gly Gln Leu Leu Cys His Thr Thr Phe Phe Asn |      |      |
| 1505  | 1510 | 1515 |
| Thr Ser Tyr Val Ala Cys Gln Met Arg Asp Leu Ala Pro Gly Phe His |      | 1520 |
| 1525  | 1530 | 1535 |
| Tyr Leu Ser Ala Val Arg Thr Ser Ala Gly Tyr Ala Cys Leu Asn Ser |      |      |
| 1540  | 1545 | 1550 |
| Val Ser Arg Asn Phe Phe Val Val Pro Gln Val Phe Asp Tyr Phe Pro |      |      |
| 1555  | 1560 | 1565 |
| Lys Asp Phe Ser Ile His Gly Gly Ser Leu Leu Thr Ile Lys Gly Thr |      |      |
| 1570  | 1575 | 1580 |
| Thr Leu Arg Gly Trp Lys Thr Thr Phe Val Tyr Val Gly Gln Gln Ala |      |      |
| 1585  | 1590 | 1595 |
| Cys Leu Thr Val Asn Ile Ser Ser Glu Phe Ile Gln Cys Ile Val Pro |      |      |
| 1605  | 1610 | 1615 |
| Ala Gly Asn Gly Ser Ala Ala Leu Glu Ile Asp Val Asp Gly Val Leu |      |      |
| 1620  | 1625 | 1630 |
| Tyr His Met Gly Phe Val Asp Tyr Ser Ser Ile Phe Thr Pro Glu Leu |      |      |
| 1635  | 1640 | 1645 |
| Leu Ser Val Ser Arg Ser His Asp Ile Leu Thr Phe Thr Val Ala Arg |      |      |
| 1650  | 1655 | 1660 |
| Ile Ser Gly Ala Ala Asn Val Asp Ile Leu Ile Gly Thr Ser Pro Cys |      |      |
| 1665  | 1670 | 1675 |
| Leu Asp Val Ala Gly Asn Arg Thr Ile Leu Arg Cys Met Val Pro Leu |      |      |
| 1685  | 1690 | 1695 |
| Leu Pro Ala Gly Glu Tyr Ala Val Thr Gly Tyr Asp His Ser Arg Gly |      |      |
| 1700  | 1705 | 1710 |
| Trp Val Ser Ser Thr Leu Ile Leu Val Leu Arg Ala Thr Val Thr Ser |      |      |
| 1715  | 1720 | 1725 |
| Val Thr Glu Asn Tyr Gly Cys Leu Gly Gly Arg Leu Leu His Val Leu |      |      |
| 1730  | 1735 | 1740 |
| Gly Ala Gly Phe Ser Pro Gly Asn Ile Ser Ala Ala Val Cys Gly Ala |      |      |
| 1745  | 1750 | 1755 |
| Pro Cys Gln Val Leu Ala Asn Ala Thr Val Ser Ala Phe Ser Cys Leu |      |      |
| 1765  | 1770 | 1775 |
| Val Leu Pro Leu Asp Ala Ser Leu Ala Phe Leu Cys Asn Leu Arg His |      |      |
| 1780  | 1785 | 1790 |
| Ala Glu Asp Ser Cys Gly Val Ser Arg Pro Thr Tyr Leu Gln Cys Asp |      |      |
| 1795  | 1800 | 1805 |
| Leu Thr Val Ser Val Gly Met Glu Arg Leu Pro Gly Ser Trp Pro Tyr |      |      |
| 1810  | 1815 | 1820 |
| Val Tyr Leu Cys Glu Glu Ser Ser Gln Gly Leu Phe Val Pro Asp His |      |      |

|                     |                                 |                 |      |      |      |      |
|---------------------|---------------------------------|-----------------|------|------|------|------|
| 1825                |                                 | 1830            |      | 1835 |      | 1840 |
| Gln Ile Phe Leu Ser | Phe Ser Gly Leu Phe Leu Ser     | Pro Lys Val Glu |      |      |      |      |
|                     | 1845                            |                 | 1850 |      | 1855 |      |
| Arg Asp Glu Val Leu | Ile Tyr Asn Ser Ser Cys Asn     | Ile Thr Met Glu |      |      |      |      |
|                     | 1860                            |                 | 1865 |      | 1870 |      |
| Thr Glu Ala Glu Met | Glu Cys Gly Thr Pro Asn Gln     | Pro Ile Thr Ala |      |      |      |      |
|                     | 1875                            |                 | 1880 |      | 1885 |      |
| Lys Ile Thr Glu Ile | Gln Lys Ser Arg Gly Gln Asn Thr | Gln Gly Asn     |      |      |      |      |
|                     | 1890                            |                 | 1895 |      | 1900 |      |
| Phe Ser Phe Gln Phe | Cys Arg Arg Trp Ser Arg Pro His | Ser Trp Phe     |      |      |      |      |
| 1905                | 1910                            |                 | 1915 |      | 1920 |      |
| Pro His Arg Val     | Pro Gln Asp Gly Asp Asn Val Thr | Val Glu Thr Ser |      |      |      |      |
|                     | 1925                            |                 | 1930 |      | 1935 |      |
| His Leu Leu Leu Leu | Asp Ala Asn Thr Ser Leu Leu Asn | Ser Leu His     |      |      |      |      |
|                     | 1940                            |                 | 1945 |      | 1950 |      |
| Ile Lys Gly Gly Lys | Leu Ile Phe Met Glu Pro Gly Pro | Ile Asp Leu     |      |      |      |      |
|                     | 1955                            |                 | 1960 |      | 1965 |      |
| Arg Ala His Ser Ile | Leu Ile Thr Asp Gly Gly Glu Leu | His Ile Gly     |      |      |      |      |
|                     | 1970                            |                 | 1975 |      | 1980 |      |
| Ser Glu Asp Lys Pro | Phe Gln Gly Lys Ala Arg Ile Lys | Leu Tyr Gly     |      |      |      |      |
| 1985                | 1990                            |                 | 1995 |      | 2000 |      |
| Ser Val His Ser Thr | Ser Phe Phe Pro Tyr Gly Val Lys | Phe Leu Ala     |      |      |      |      |
|                     | 2005                            |                 | 2010 |      | 2015 |      |
| Val Arg Asn Gly Thr | Leu Ser Leu His Gly Ser Val Pro | Glu Val Thr     |      |      |      |      |
|                     | 2020                            |                 | 2025 |      | 2030 |      |
| Phe Thr Tyr Leu Arg | Ala Ala Ala Cys Ala Gly Asp Thr | Val Leu Ala     |      |      |      |      |
|                     | 2035                            |                 | 2040 |      | 2045 |      |
| Leu Glu Glu Ala Val | Ala Trp His Pro Gly Asp Glu Ala | Val Ile Ser     |      |      |      |      |
|                     | 2050                            |                 | 2055 |      | 2060 |      |
| Ser Gly Ala Thr Val | Glu Gly Ala Glu Ala Thr Glu Glu | Val Val Val     |      |      |      |      |
| 2065                | 2070                            |                 | 2075 |      | 2080 |      |
| Val Glu Thr Val His | Asp Ala Asp Leu His Leu Arg Asn | Pro Leu Arg     |      |      |      |      |
|                     | 2085                            |                 | 2090 |      | 2095 |      |
| Tyr Ser Tyr Asn Phe | Thr Glu Asn Trp Val Thr Gly Val | Asn His Ile     |      |      |      |      |
|                     | 2100                            |                 | 2105 |      | 2110 |      |
| Leu Lys Ala Thr Val | Ala Leu Leu Ser Arg Asn Ile Ile | Val Gln Gly     |      |      |      |      |
|                     | 2115                            |                 | 2120 |      | 2125 |      |
| Asn Leu Thr Leu Glu | Arg Val Lys Leu Leu Asp Ser Cys | Gln Glu Ala     |      |      |      |      |
|                     | 2130                            |                 | 2135 |      | 2140 |      |
| Gly Ala Ala Glu Gly | Asn Leu Lys His Cys Leu Tyr Ser | Lys Ser Glu     |      |      |      |      |
| 2145                | 2150                            |                 | 2155 |      | 2160 |      |
| Lys Met Leu Gly Ala | Arg Asn Leu Gly Ala Arg Val Ile | Ile Gln Ser     |      |      |      |      |
|                     | 2165                            |                 | 2170 |      | 2175 |      |
| Phe Pro Glu Glu Pro | Ser Leu Val Lys Leu Lys Gly Val | Gln Phe Arg     |      |      |      |      |
|                     | 2180                            |                 | 2185 |      | 2190 |      |
| Asp Leu Gly Gln Ala | Phe His Lys His Leu Ser Ser Leu | Thr Leu Val     |      |      |      |      |
|                     | 2195                            |                 | 2200 |      | 2205 |      |
| Gly Ala Met Arg Gly | Ser Tyr Leu His Ser Cys Ser Met | Trp Gly Ser     |      |      |      |      |
|                     | 2210                            |                 | 2215 |      | 2220 |      |
| Phe Ser Arg Gly Leu | Ser Ile His Arg Thr Trp Gly Leu | Lys Val Glu     |      |      |      |      |
| 2225                | 2230                            |                 | 2235 |      | 2240 |      |
| Asn Asn Ile Phe Tyr | Lys Ile Val Gly His Ala Leu Leu | Val Gly Ser     |      |      |      |      |



|      |      |      |      |     |      |      |      |      |     |      |      |      |      |      |      |  |
|------|------|------|------|-----|------|------|------|------|-----|------|------|------|------|------|------|--|
|      |      |      |      |     | 2245 |      |      |      |     | 2250 |      |      |      | 2255 |      |  |
| Tyr  | Met  | Asp  | Arg  | Ser | Phe  | Ser  | Thr  | Ser  | Glu | Ala  | Val  | Ile  | Gly  | Arg  | Lys  |  |
|      |      |      | 2260 |     |      |      |      | 2265 |     |      |      |      | 2270 |      |      |  |
| Asn  | Gly  | Trp  | Trp  | Glu | Glu  | Gly  | Ser  | Met  | Ile | Arg  | Asn  | Asn  | Val  | Ile  | Ile  |  |
|      |      | 2275 |      |     |      |      | 2280 |      |     |      | 2285 |      |      |      |      |  |
| Asn  | Val  | Ser  | Gly  | Ala | Glu  | Gly  | Leu  | Ser  | Ser | Ser  | Glu  | Met  | Leu  | Ala  | Pro  |  |
|      | 2290 |      |      |     |      | 2295 |      |      |     | 2300 |      |      |      |      |      |  |
| Ala  | Gly  | Ile  | Tyr  | Thr | Phe  | Ser  | Pro  | Thr  | Ser | Ala  | Ile  | Glu  | Gly  | Asn  | Arg  |  |
| 2305 |      |      |      |     | 2310 |      |      |      |     | 2315 |      |      |      |      | 2320 |  |
| Val  | Cys  | Ala  | Ala  | Gly | Tyr  | Gly  | Tyr  | Val  | Leu | His  | Leu  | Val  | Thr  | Ser  | Gln  |  |
|      |      |      | 2325 |     |      |      |      | 2330 |     |      |      |      |      | 2335 |      |  |
| Thr  | Val  | Gln  | Ala  | Pro | Leu  | Leu  | Ser  | Phe  | Asn | Trp  | Asn  | Thr  | Ala  | His  | Ser  |  |
|      |      | 2340 |      |     |      |      | 2345 |      |     |      | 2350 |      |      |      |      |  |
| Cys  | Thr  | Arg  | Tyr  | Gly | Leu  | Leu  | Val  | Tyr  | Pro | Glu  | Phe  | Gln  | Pro  | Pro  | Trp  |  |
|      | 2355 |      |      |     |      |      | 2360 |      |     | 2365 |      |      |      |      |      |  |
| Asn  | Asn  | Asp  | Thr  | Gly | Phe  | Thr  | Leu  | Phe  | Gln | Asn  | Phe  | Met  | Val  | Trp  | Gly  |  |
|      | 2370 |      |      |     |      | 2375 |      |      |     | 2380 |      |      |      |      |      |  |
| Ser  | Ala  | Gly  | Gly  | Ala | Gln  | Ile  | Phe  | Arg  | Ser | Asn  | Asn  | Leu  | His  | Leu  | Arg  |  |
| 2385 |      |      |      |     | 2390 |      |      |      |     | 2395 |      |      |      |      | 2400 |  |
| Asn  | Phe  | Gln  | Val  | Tyr | Ala  | Cys  | Arg  | Asp  | Phe | Gly  | Ile  | Asp  | Ile  | Leu  | Glu  |  |
|      |      |      | 2405 |     |      |      |      | 2410 |     |      |      |      | 2415 |      |      |  |
| Ser  | Asp  | Thr  | Asn  | Thr | Leu  | Val  | Thr  | Asp  | Ser | Phe  | Leu  | Leu  | Gly  | His  | Phe  |  |
|      |      | 2420 |      |     |      |      | 2425 |      |     |      |      | 2430 |      |      |      |  |
| Thr  | His  | Glu  | Gly  | Ser | Leu  | Cys  | Met  | Ser  | Val | Gly  | Ile  | Lys  | Thr  | Pro  | Lys  |  |
|      | 2435 |      |      |     |      |      | 2440 |      |     |      |      | 2445 |      |      |      |  |
| Arg  | Trp  | Gly  | Leu  | Thr | Ile  | Ser  | Asn  | Thr  | Thr | Phe  | Val  | Asn  | Phe  | Asp  | Leu  |  |
|      | 2450 |      |      |     |      | 2455 |      |      |     | 2460 |      |      |      |      |      |  |
| Asn  | Cys  | Val  | Ala  | Ile | Arg  | Thr  | Cys  | Ser  | Gly | Cys  | Ser  | Gln  | Gly  | Gln  | Gly  |  |
| 2465 |      |      |      |     | 2470 |      |      |      |     | 2475 |      |      |      |      | 2480 |  |
| Gly  | Phe  | Pro  | Val  | Lys | Thr  | Arg  | Gln  | Leu  | Lys | Phe  | Val  | Asn  | Ser  | Ser  | Asn  |  |
|      |      |      | 2485 |     |      |      |      | 2490 |     |      |      |      |      | 2495 |      |  |
| Leu  | Val  | Ala  | Phe  | Pro | Phe  | Pro  | His  | Ala  | Ala | Val  | Leu  | Gln  | Asp  | Leu  | Asp  |  |
|      |      | 2500 |      |     |      |      | 2505 |      |     |      |      | 2510 |      |      |      |  |
| Gly  | Ser  | Leu  | Ser  | Gly | Lys  | Asn  | Gly  | Ser  | His | Val  | Leu  | Ala  | Ser  | Met  | Glu  |  |
|      | 2515 |      |      |     |      |      | 2520 |      |     |      |      | 2525 |      |      |      |  |
| Thr  | Leu  | Ser  | Asp  | Thr | Cys  | Leu  | Thr  | Asn  | Ala | Ser  | Phe  | Ser  | Gln  | Ile  | Val  |  |
|      | 2530 |      |      |     |      | 2535 |      |      |     |      | 2540 |      |      |      |      |  |
| Ser  | Gly  | Ser  | Val  | Cys | Gly  | Glu  | Ala  | Val  | Leu | Phe  | His  | Arg  | Met  | Ser  | Ile  |  |
| 2545 |      |      |      |     | 2550 |      |      |      |     | 2555 |      |      |      |      | 2560 |  |
| Gly  | Leu  | Ala  | Lys  | Ser | Leu  | Asp  | Val  | Pro  | Lys | Asn  | Leu  | Thr  | Met  | Thr  | Asp  |  |
|      |      |      | 2565 |     |      |      |      | 2570 |     |      |      |      |      | 2575 |      |  |
| Ile  | Arg  | Asn  | Arg  | Thr | Ile  | Thr  | Ile  | Asn  | Tyr | Val  | Asp  |      |      |      |      |  |

|      |     |      |     |     |     |     |      |     |     |      |     |      |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
|------|-----|------|-----|-----|-----|-----|------|-----|-----|------|-----|------|-----|-----|-----|--|------|--|--|--|--|--|--|------|--|--|
|      |     |      |     |     |     |     |      |     |     | 2660 |     |      |     |     |     |  | 2665 |  |  |  |  |  |  | 2670 |  |  |
| Asp  | Trp | Phe  | Phe | His | Arg | Gln | Leu  | Arg | Gln | Leu  | Thr | Tyr  | Leu | Val | Ser |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2675 |     |     |     |     | 2680 |     |     |      |     | 2685 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Gly  | Glu | Gly  | Gln | Val | His | Val | Phe  | Leu | Gln | Val  | Lys | His  | Gly | Ala | Pro |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2690 |     |     |     |     | 2695 |     |     |      |     | 2700 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Pro  | Thr | Val  | Ser | Ala | Ser | Thr | Ser  | Val | Ser | Glu  | Ser | Ala  | Leu | Lys | Trp |  |      |  |  |  |  |  |  |      |  |  |
| 2705 |     |      |     |     |     |     | 2710 |     |     |      |     | 2715 |     |     |     |  | 2720 |  |  |  |  |  |  |      |  |  |
| Ser  | Leu | Pro  | Glu | Thr | Trp | Gln | Asp  | Val | Glu | Lys  | Gly | Trp  | Gly | Gly | Tyr |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2725 |     |     |     |     | 2730 |     |     |      |     | 2735 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Asn  | His | Thr  | Ile | Pro | Gly | Pro | Gly  | Asp | Asp | Val  | Leu | Ile  | Leu | Pro | Asn |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2740 |     |     |     |     | 2745 |     |     |      |     | 2750 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Lys  | Thr | Val  | Leu | Val | Asp | Thr | Asp  | Leu | Pro | Val  | Leu | Arg  | Cys | Leu | Tyr |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2755 |     |     |     |     | 2760 |     |     |      |     | 2765 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Val  | Met | Gly  | Thr | Leu | Glu | Phe | Pro  | Val | Asp | Arg  | Ser | Asn  | Val | Leu | Ser |  |      |  |  |  |  |  |  |      |  |  |
| 2770 |     |      |     |     |     |     | 2775 |     |     |      |     | 2780 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Val  | Ala | Cys  | Leu | Leu | Ile | Ala | Gly  | Gly | Glu | Leu  | Lys | Val  | Gly | Thr | Leu |  |      |  |  |  |  |  |  |      |  |  |
| 2785 |     | 2790 |     |     |     |     | 2795 |     |     |      |     | 2800 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Glu  | Asn | Pro  | Leu | Gly | Lys | Asp | Gln  | Arg | Leu | Leu  | Ile | Leu  | Leu | Arg | Ala |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2805 |     |     |     |     | 2810 |     |     |      |     | 2815 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Ser  | Glu | Glu  | Ile | Phe | Cys | Asp | Arg  | Phe | Asp | Gly  | Ile | Arg  | Val | Asp | Pro |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2820 |     |     |     |     | 2825 |     |     |      |     | 2830 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Gly  | Thr | Ile  | Gly | Val | Tyr | Gly | Lys  | Leu | Arg | Leu  | His | Ser  | Ala | Tyr | Pro |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2835 |     |     |     |     | 2840 |     |     |      |     | 2845 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Lys  | Lys | Ser  | Trp | Val | His | Leu | Gly  | Ala | Asp | Ile  | Ala | Pro  | Gly | Asn | Glu |  |      |  |  |  |  |  |  |      |  |  |
| 2850 |     |      |     |     |     |     | 2855 |     |     |      |     | 2860 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Arg  | Ile | Ile  | Val | His | Asn | Ala | Val  | Asp | Trp | Gln  | Pro | His  | Asp | Lys | Ile |  |      |  |  |  |  |  |  |      |  |  |
| 2865 |     | 2870 |     |     |     |     | 2875 |     |     |      |     | 2880 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Val  | Leu | Ser  | Ser | Ser | Ser | Tyr | Glu  | Pro | His | Glu  | Ala | Glu  | Val | Leu | Thr |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2885 |     |     |     |     | 2890 |     |     |      |     | 2895 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Val  | Lys | Glu  | Val | Lys | Asp | His | His  | Ile | Arg | Ile  | Tyr | Glu  | Arg | Leu | Lys |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2900 |     |     |     |     | 2905 |     |     |      |     | 2910 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| His  | Arg | His  | Ile | Gly | Ser | Ala | His  | Thr | Leu | Glu  | Asp | Ser  | Arg | Gln | Ile |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2915 |     |     |     |     | 2920 |     |     |      |     | 2925 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Cys  | Leu | Ala  | Ala | Glu | Val | Gly | Leu  | Leu | Thr | Arg  | Asn | Ile  | Arg | Ile | Gln |  |      |  |  |  |  |  |  |      |  |  |
| 2930 |     | 2935 |     |     |     |     | 2940 |     |     |      |     |      |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Ser  | Asp | Ser  | Ser | Cys | Arg | Gly | Arg  | Leu | Leu | Val  | Gly | Ser  | Phe | Arg | Lys |  |      |  |  |  |  |  |  |      |  |  |
| 2945 |     | 2950 |     |     |     |     | 2955 |     |     |      |     | 2960 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Ser  | Ser | Gly  | Glu | Glu | Phe | Ser | Gly  | Ile | Leu | Gln  | Leu | Leu  | Asn | Val | Glu |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2965 |     |     |     |     | 2970 |     |     |      |     | 2975 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Ile  | Gln | Asn  | Met | Gly | Ser | Pro | Leu  | Tyr | Ala | Ser  | Ile | Glu  | Phe | Pro | Gly |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2980 |     |     |     |     | 2985 |     |     |      |     | 2990 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Val  | Ser | Ala  | Gly | Ser | Trp | Val | Ile  | Ser | Ser | Thr  | Val | His  | Gln | Ser | Cys |  |      |  |  |  |  |  |  |      |  |  |
|      |     | 2995 |     |     |     |     | 3000 |     |     |      |     | 3005 |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Thr  | Val | Gly  | Ile | His | Ala | Ser | Ser  | Ser | Arg | Gly  | Met | Val  | Leu | Asn | Asp |  |      |  |  |  |  |  |  |      |  |  |
| 3010 |     | 3015 |     |     |     |     | 3020 |     |     |      |     |      |     |     |     |  |      |  |  |  |  |  |  |      |  |  |
| Asn  | Ile | Val  | Phe | Gly | Thr | Lys | Gly  | His | Gly | Ile  | Asp |      |     |     |     |  |      |  |  |  |  |  |  |      |  |  |

|   |   |                     |
|---|---|---------------------|
| 3075  | 3080  | 3085                |
| His Val Arg Gly   | His Gly Cys Ser Ser Glu Val                 | Leu Trp Ser Asp Asn |
| 3090  | 3095  | 3100                |
| Val Val His Ser Ser   | Leu His Gly Ile His Leu Tyr Lys Lys Arg Glu |                     |
| 3105  | 3110  | 3115                |
| Pro Asn Asn Cys Thr Gly Val Ser Gly Phe Leu Ala Phe Lys Asn Phe |   | 3120                |
| 3125  | 3130  | 3135                |
| Asp Tyr Gly Ala Met Val Gln Thr Glu Asn Ser Val Asp Ile Gln Asn |   |                     |
| 3140  | 3145  | 3150                |
| Ile Thr Leu Val Asp Asn Thr Val Gly Leu Leu Ala Ile Ser Tyr Val |   |                     |
| 3155  | 3160  | 3165                |
| Ser Ser Ala Pro Leu Arg Ser Gly Ser Thr Leu Gln Ile Thr Leu Arg |   |                     |
| 3170  | 3175  | 3180                |
| Asn Ser Val Ile Val Ala Thr Ser Ser Ser Phe Asp Cys Ile Gln Asp |   |                     |
| 3185  | 3190  | 3195                |
| Arg Lys Ala Pro Gln Ser Ala Asn Trp Thr Ser Thr Asp Arg Ala Pro |   | 3200                |
| 3205  | 3210  | 3215                |
| Ser Asn Pro Arg Gly Gly Arg Ile Gly Ile Leu Trp Pro Val Ser Ala |   |                     |
| 3220  | 3225  | 3230                |
| Ser Glu Pro Asn Gly Trp Pro Gln Glu Pro Trp His Lys Val Arg Gly |   |                     |
| 3235  | 3240  | 3245                |
| Gly His Ser Val Pro Gly Ile Met Lys Leu Gln Asp Val Thr Phe Ser |   |                     |
| 3250  | 3255  | 3260                |
| Ser Phe Val Lys Ser Cys Tyr Ser Asp Asp Leu Asp Val Cys Ile Leu |   |                     |
| 3265  | 3270  | 3275                |
| Thr Asn Glu His Ser Thr Gly Ile Met Tyr Pro Ile Thr Ala Glu Arg |   | 3280                |
| 3285  | 3290  | 3295                |
| Thr Arg Met Leu Lys Ile Lys Asp Lys Asn Lys Phe Tyr Phe Leu Pro |   |                     |
| 3300  | 3305  | 3310                |
| Leu Gln Ser Gly Lys Asp Leu Val Gly Thr Ile Cys Pro Ala Ser Ser |   |                     |
| 3315  | 3320  | 3325                |
| Asp Cys Glu Ile Pro Arg Lys Tyr Leu Phe Thr Asp Leu Asp Gly Arg |   |                     |
| 3330  | 3335  | 3340                |
| Thr Leu Gly Leu Ser Pro Pro Val Ser Val Phe Pro Arg Ile Glu Glu |   |                     |
| 3345  | 3350  | 3355                |
| Gly Trp Thr Gly Ser Phe Phe Asn Thr Gly Ile Phe Arg Glu Glu Gln |   | 3360                |
| 3365  | 3370  | 3375                |
| Lys Cys Thr Phe Arg Ala Met Ile Gln Gly Phe Phe Cys Lys Gln Thr |   |                     |
| 3380  | 3385  | 3390                |
| Glu His Ala Val Leu Ile Leu Asp Asn Val Asp Val Thr Trp Thr Ile |   |                     |
| 3395  | 3400  | 3405                |
| Pro Lys Phe Tyr Pro Leu Val Ser Ile Thr Asn Gly Phe Val Asp Thr |   |                     |
| 3410  | 3415  | 3420                |
| Phe Ser Ile Val Lys Asp Ser Gly Leu Cys Phe Pro Thr Ser Ser Pro |   |                     |
| 3425  | 3430  | 3435                |
| Ser Thr Phe Tyr Ser Ile Leu Pro Thr Ser Gln Met Thr Lys Val Cys |   | 3440                |
| 3445  | 3450  | 3455                |
| Phe Pro Glu Arg Thr Pro Pro Phe Leu His Phe Phe Leu Leu Ala Asn |   |                     |
| 3460  | 3465  | 3470                |
| Arg Arg Ala Ser Lys Leu Ile Leu Ala Val Phe Tyr Asn Glu Ile Gln |   |                     |
| 3475  | 3480  | 3485                |
| Ser Pro Tyr Val Phe Leu Asp Lys Ser Phe Ile Pro Pro Thr Pro Val |   |                     |

|   |      |           |
|---|------|-----------|
| 3490  | 3495 | 3500      |
| Glu Ser Ala Phe Ser Leu Leu Asp Glu Pro Val Gly Ala Asn Tyr Phe |      |           |
| 3505  | 3510 | 3515 3520 |
| Asp Ile Met Asn Asn Leu Leu Tyr Val Val Leu Gln Gly Glu Glu Ala |      |           |
|   | 3525 | 3530 3535 |
| Val Glu Ile Arg Ser Ser Val Ser Ile His Leu Ala Leu Thr Val Thr |      |           |
|   | 3540 | 3545 3550 |
| Phe Ser Val Leu Glu Lys Gly Trp Glu Lys Ala Val Leu Glu Ser Leu |      |           |
|   | 3555 | 3560 3565 |
| Arg Gly Phe Phe Gln Ile Asp Gln Asn Gln Ile Arg Leu Thr Leu Glu |      |           |
|   | 3570 | 3575 3580 |
| Met Pro Gly Asn Lys Glu Thr Leu Lys Ala Ile Ala Asn Ser Glu Gly |      |           |
| 3585  | 3590 | 3595 3600 |
| Lys Arg Lys Arg Ser Cys Pro Thr Val Thr Cys Ala Val Pro Ser Ser |      |           |
|   | 3605 | 3610 3615 |
| Arg Tyr Val Gln Arg Arg Pro Leu Met Ala Glu Met Ala Ser Phe Thr |      |           |
|   | 3620 | 3625 3630 |
| Ile Thr Pro Ala Thr Thr Leu Glu Thr Phe Ser Lys Val Ile Val Phe |      |           |
|   | 3635 | 3640 3645 |
| Glu Ile Gly Asp Leu Pro Asn Ala Arg Asp Ser Glu Phe Ile Gln Ser |      |           |
|   | 3650 | 3655 3660 |
| Leu Pro Ser Asn Arg Leu Gln Lys Leu Ala His Gln Val Ile Thr Ala |      |           |
| 3665  | 3670 | 3675 3680 |
| Gln Gln Thr Gly Val Leu Glu Asn Val Leu Gly Met Thr Val Gly Ala |      |           |
|   | 3685 | 3690 3695 |
| Leu Leu Val Ala Gln Ser Glu Gly Val Thr Gly Tyr Arg Asn Ala Ser |      |           |
|   | 3700 | 3705 3710 |
| Ser Leu Ile Thr Gly Asn Gln Ile Tyr Thr Arg Pro Ser Val Val Ser |      |           |
|   | 3715 | 3720 3725 |
| Ile Leu Val Gln Pro Ser Asp Gly Glu Val Gly Ile Glu Leu Pro Ile |      |           |
|   | 3730 | 3735 3740 |
| Gln Pro Arg Leu Ile Phe Leu Asp Glu Lys Asn Glu Arg Val Glu Ala |      |           |
| 3745  | 3750 | 3755 3760 |
| Leu Gly Leu Pro Ser Glu Pro Trp Ile Ile Ser Val Ser Leu Glu Gly |      |           |
|   | 3765 | 3770 3775 |
| Thr Ser Glu Ser Met Leu Lys Gly Cys Thr Gln Ala Glu Thr Gln Asp |      |           |
|   | 3780 | 3785 3790 |
| Gly Tyr Val Thr Phe Ser Arg Leu Ala Val Leu Thr Ser Gly Ser Asn |      |           |
|   | 3795 | 3800 3805 |
| Trp His Leu Val Phe Thr Val Thr Phe Pro Pro Gly Thr Asn Leu Thr |      |           |
|   | 3810 | 3815 3820 |
| Ala Arg Ser Lys Thr Phe Ala Val Leu Pro Val Ala Gly Lys Glu Arg |      |           |
| 3825  | 3830 | 3835 3840 |
| Ser Thr Ile Ile Leu Ala Leu Ser Leu Cys Ser Val Ala Ser Trp Val |      |           |
|   | 3845 | 3850 3855 |
| Ala Leu Ser Cys Leu Ile Cys Cys Trp Phe Lys Lys Ser Lys Thr Arg |      |           |
|   | 3860 | 3865 3870 |
| Lys Ile Lys Pro Glu Asp Ile Ser Glu Ser Gln Ala Lys Glu Gln Lys |      |           |
|   | 3875 | 3880 3885 |
| Lys Asn Thr His Ile Ser Ser Lys Pro Arg Glu Leu Gln Val Lys Thr |      |           |
|   | 3890 | 3895 3900 |
| Ala Lys Glu Asp Ala Met Met Gly Glu Asp Met Arg Met Lys Val Met |      |           |

3905                      3910                      3915                      3920  
 Glu Gly Arg Gln Asn Gln Phe Ser Gln His Ser Met Asp Gly Val Ser  
                                  3925                      3930                      3935  
 Lys Arg Lys Val Ser Arg Arg Ala Val Pro Glu Glu Arg Thr Ala Thr  
                                  3940                      3945                      3950  
 Pro Ala Leu Lys Ile Pro Arg Thr Thr Cys Val Pro Gly Ala Leu Pro  
                                  3955                      3960                      3965  
 Gln Gln Leu Thr Leu Pro Glu Pro Gly Asn Trp Gln Glu Ala Gln Gln  
                                  3970                      3975                      3980  
 Gln Leu Leu Arg Tyr Gln Leu Ala Gly Arg Asp Gln Leu Leu Leu Leu  
 3985                      3990                      3995                      4000  
 Cys Pro Asp Leu Arg Gln Glu Arg Gln Gln Gly Gln Glu Pro Ser Gln  
                                  4005                      4010                      4015  
 Leu Asn Lys Gly Ser Gly Arg Cys Met Gly Leu Ser Gln Glu Lys Ala  
                                  4020                      4025                      4030  
 Thr Cys Val Pro Thr Glu Thr Phe Cys Leu His Thr Ala Pro Pro Glu  
                                  4035                      4040                      4045  
 Thr Ile Gln  
                                  4050

<210> 8  
 <211> 77  
 <212> PRT  
 <213> Homo sapien

<400> 8  
 Ser Glu Ile Leu Ser Val Phe Pro Glu Thr Gly Ser Leu Gly Gly Arg  
   1                                  5                                  10                                  15  
 Thr Asn Ile Thr Ile Thr Gly Asp Phe Phe Asp Asn Ser Ala Gln Val  
                                   20                                  25                                  30  
 Thr Ile Ala Gly Ile Pro Cys Asp Ile Arg His Val Ser Pro Arg Lys  
                                   35                                  40                                  45  
 Ile Glu Cys Thr Thr Arg Ala Pro Gly Lys Asp Val Arg Leu Thr Thr  
                                   50                                  55                                  60  
 Pro Gln Pro Gly Asn Arg Gly Leu Leu Phe Glu Val Gly  
 65                                  70                                  75

<210> 9  
 <211> 85  
 <212> PRT  
 <213> Homo sapien

<400> 9  
 Pro Cys Val His Ser Val Trp Tyr Ser Ile Asp Gly Asp Ile Asn Leu  
   1                                  5                                  10                                  15  
 Met Ile Tyr Ile Thr Gly Thr Gly Phe Ser Gly Asp Ser Gln Phe Leu  
                                   20                                  25                                  30  
 Gln Val Thr Val Asn Lys Thr Ser Cys Lys Val Ile Phe Ser Asn Gln  
                                   35                                  40                                  45  
 Thr Asn Val Val Cys Gln Thr Asp Leu Leu Pro Val Gly Met His Arg  
                                   50                                  55                                  60  
 Ile Leu Met Leu Val Arg Pro Ser Gly Leu Ala Ile Ser Ala Thr Gly

```
<210> 10
<211> 85
<212> PRT
<213> Homo sapien
```

```
<210> 11
<211> 92
<212> PRT
<213> Homo sapien
```

```
<210> 12
<211> 91
<212> PRT
<213> Homo sapien
```

```

<400> 12
Pro Arg Ile Met Ala Ile Phe Pro Ser Gln Gly Ser Ala Cys Gly Gly
 1          5          10          15
Thr Ile Leu Thr Val Arg Gly Leu Leu Asn Ser Arg Arg Ser
      20          25          30

```

Val Arg Val Asp Leu Ser Gly Pro Phe Thr Cys Val Ile Leu Ser Leu  
                   35                  40                  45  
 Gly Asp His Thr Ile Leu Cys Gln Val Ser Leu Glu Gly Asp Pro Leu  
           50                  55                  60  
 Pro Gly Ala Ser Phe Ser Leu Asn Val Thr Val Leu Val Asn Gly Leu  
 65                  70                  75                  80  
 Thr Ser Glu Cys Gln Gly Asn Cys Thr Leu Phe  
                   85                  90

<210> 13  
 <211> 85  
 <212> PRT  
 <213> Homo sapien

<400> 13  
 Pro Val Met Asp Ala Leu Ser Thr Asn Thr Ser Gly Ser Leu Thr Thr  
 1                  5                  10                  15  
 Val Leu Ile Arg Gly Gln Arg Leu Ala Thr Thr Ala Asp Glu Pro Met  
           20                  25                  30  
 Val Phe Val Asp Asp Gln Leu Pro Cys Asn Val Thr Phe Phe Asn Ala  
           35                  40                  45  
 Ser His Val Val Cys Gln Thr Arg Asp Leu Ala Pro Gly Pro His Tyr  
           50                  55                  60  
 Leu Ser Val Phe Tyr Thr Arg Asn Gly Tyr Ala Cys Ser Gly Asn Val  
 65                  70                  75                  80  
 Ser Arg His Phe Tyr  
                   85

<210> 14  
 <211> 87  
 <212> PRT  
 <213> Homo sapien

<400> 14  
 Pro Gln Val Phe His Tyr Phe Pro Lys Asn Phe Ser Leu His Gly Gly  
 1                  5                  10                  15  
 Ser Leu Leu Thr Ile Glu Gly Thr Gly Leu Arg Gly Gln Asn Thr Thr  
           20                  25                  30  
 Ser Val Tyr Ile Asp Gln Gln Thr Cys Leu Thr Val Asn Ile Gly Ala  
           35                  40                  45  
 Glu Leu Ile Arg Cys Ile Val Pro Thr Gly Asn Gly Ser Val Ala Leu  
           50                  55                  60  
 Glu Ile Glu Val Asp Gly Leu Trp Tyr His Ile Gly Val Ile Gly Tyr  
 65                  70                  75                  80  
 Asn Lys Ala Phe Thr Pro Glu  
                   85

<210> 15  
 <211> 92  
 <212> PRT  
 <213> Homo sapien

<400> 15

|          |     |     |     |          |     |     |     |     |     |     |     |     |     |     |     |
|----------|-----|-----|-----|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His<br>1 | Leu | Ser | Leu | His<br>5 | Ile | Glu | Pro | Glu | Glu | Gly | Ser | Leu | Ala | Gly | Gly |
| Thr      | Trp | Ile | Thr | Val      | Ile | Phe | Asp | Gly | Leu | Glu | Leu | Gly | Val | Leu | Tyr |
|          |     |     | 20  |          |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Pro      | Asn | Asn | Gly | Ser      | Gln | Leu | Glu | Ile | His | Leu | Val | Asn | Val | Asn | Met |
|          |     | 35  |     |          |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Val      | Val | Pro | Ala | Leu      | Arg | Ser | Val | Pro | Cys | Asp | Val | Phe | Pro | Val | Phe |
|          |     | 50  |     |          |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Leu      | Asp | Leu | Pro | Val      | Val | Thr | Cys | Arg | Thr | Arg | Ser | Val | Leu | Ser | Glu |
| 65       |     |     |     |          | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ala      | His | Glu | Gly | Leu      | Tyr | Phe | Leu | Glu | Ala | Tyr | Phe |     |     |     |     |
|          |     |     |     | 85       |     |     |     |     | 90  |     |     |     |     |     |     |

<210> 16

<211> 109

<212> PRT

<213> Homo sapien

<400> 16

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Ile | Val | His | Gln | Val | Tyr | Pro | Pro | Ser | Gly | Val | Pro | Gly | Lys | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ile | His | Val | Tyr | Gly | Trp | Ile | Ile | Thr | Gly | Arg | Leu | Glu | Thr | Phe | Asp |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Phe | Asp | Ala | Glu | Tyr | Ile | Asp | Ser | Pro | Val | Ile | Leu | Glu | Ala | Gln | Gly |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Asp | Lys | Trp | Val | Thr | Pro | Cys | Ser | Leu | Ile | Asn | Arg | Gln | Met | Gly | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Cys | Tyr | Pro | Ile | Gln | Glu | Asp | His | Gly | Leu | Gly | Thr | Leu | Gln | Cys | His |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Val | Glu | Gly | Asp | Tyr | Ile | Gly | Ser | Gln | Asn | Val | Ser | Phe | Ser | Val | Phe |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Asn | Lys | Gly | Lys | Ser | Met | Val | His | Lys | Lys | Ala | Trp | Leu |     |     |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     |     |     |

<210> 17

<211> 84

<212> PRT

<213> Homo sapien

<400> 17

[illegible]



<210> 18  
 <211> 82  
 <212> PRT  
 <213> Homo sapien

<400> 18  
 Pro Val Val Thr Ala Met Gln Gly Glu Ile Thr Asn Ser Ser Leu Ser  
 1 5 10 15  
 Leu His Val Gly Gly Ser Asn Leu Ser Asn Ser Val Ile Leu Leu Gly  
 20 25 30  
 Asn Leu Asn Cys Asp Val Glu Thr Gln Ser Phe Gln Gly Asn Val Ser  
 35 40 45  
 Leu Ser Gly Cys Ser Ile Pro Leu His Ser Leu Glu Ala Gly Ile Tyr  
 50 55 60  
 Pro Leu Gln Val Arg Gln Lys Gln Met Gly Phe Ala Asn Met Ser Val  
 65 70 75 80  
 Val Leu

<210> 19  
 <211> 85  
 <212> PRT  
 <213> Homo sapien

<400> 19  
 Pro Glu Leu Ile Ser Ile Ser Gln Ser Asp Asp Ile Leu Thr Phe Ala  
 1 5 10 15  
 Val Ala Gln Ile Ser Gly Ala Ala Asn Ile Asp Ile Phe Ile Gly Met  
 20 25 30  
 Ser Pro Cys Val Gly Val Ser Gly Asn His Thr Val Leu Gln Cys Val  
 35 40 45  
 Val Pro Ser Leu Pro Ala Gly Glu Tyr His Val Arg Gly Tyr Asp Cys  
 50 55 60  
 Ile Arg Gly Trp Ala Ser Ser Ala Leu Val Phe Thr Ser Arg Val Ile  
 65 70 75 80  
 Ile Thr Ala Val Thr  
 85

<210> 20  
 <211> 81  
 <212> PRT  
 <213> Mus musculus

<400> 20  
 Pro Ala Val Ala Ser Val Ser Pro Thr Ser Gly Ser Ile Ala Gly Gly  
 1 5 10 15  
 Thr Thr Leu Met Ile Thr Gly Asn Gly Phe Ser Pro Gly Asn Thr Thr  
 20 25 30  
 Val Thr Val Gly Asp Gln Pro Cys Gln Ile Thr Phe Ile Ser Ser Ser  
 35 40 45

Glu Val Tyr Cys Ser Thr Pro Ala Gly Arg Ala Gly Thr Ala Asn Leu  
 50 55 60  
 Lys Ile Ser Val Asn Ala Ile Ile Tyr Pro Pro Leu Ser Phe Thr Tyr  
 65 70 75 80  
 Ala

<210> 21  
 <211> 83  
 <212> PRT  
 <213> Mus musculus

<400> 21  
 Pro Val Ile Thr Ser Ile Ser Pro Arg Tyr Gly Pro Gln Ala Gly Gly  
 1 5 10 15  
 Thr Leu Leu Thr Leu Thr Gly Lys Tyr Leu Asn Ser Gly Asn Ser Arg  
 20 25 30  
 His Ile Ser Ile Gly Gly Lys Thr Cys Thr Leu Lys Ser Val Ser Asp  
 35 40 45  
 Ser Ile Leu Glu Cys Tyr Thr Pro Ala Gln Thr Thr Ser Asp Glu Phe  
 50 55 60  
 Pro Val Lys Leu Lys Ile Asp Leu Ala Asn Arg Glu Thr Ser Ser Phe  
 65 70 75 80  
 Ser Tyr Arg

<210> 22  
 <211> 85  
 <212> PRT  
 <213> Mus musculus

<400> 22  
 Pro Thr Phe Tyr Arg Val Ser Pro Ser Arg Gly Pro Leu Ser Gly Gly  
 1 5 10 15  
 Thr Trp Ile Gly Ile Glu Gly Ser His Leu Asn Ala Gly Ser Asp Val  
 20 25 30  
 Ala Val Ser Ile Gly Gly Arg Pro Cys Ser Phe Ser Trp Arg Asn Ser  
 35 40 45  
 Arg Glu Ile Arg Cys Leu Thr Pro Pro Gly His Thr Pro Gly Ser Ala  
 50 55 60  
 Pro Ile Val Ile Asn Ile Asn Arg Ala Gln Leu Ser Asn Pro Glu Val  
 65 70 75 80  
 Lys Tyr Asn Tyr Thr  
 85

<210> 23  
 <211> 86  
 <212> PRT  
 <213> Homo sapien

<400> 23  
 Pro Val Leu Ile Ala Val Gln Pro Leu Phe Gly Pro Arg Ala Gly Gly

```

      1           5           10           15
Thr Cys Leu Thr Leu Glu Gly Gln Ser Leu Ser Val Gly Thr Ser Arg
      20           25           30
Ala Val Leu Val Asn Gly Thr Glu Cys Leu Leu Ala Arg Val Ser Glu
      35           40           45
Gly Gln Leu Leu Cys Ala Thr Pro Pro Gly Ala Thr Val Ala Ser Val
      50           55           60
Pro Leu Ser Leu Gln Val Gly Gly Ala Gln Val Pro Gly Ser Trp Thr
      65           70           75           80
Phe Gln Tyr Arg Glu Asp
      85

```

```

<210> 24
<211> 88
<212> PRT
<213> Artificial Sequence

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<220>
<223> Consensus

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```

<400> 24
Pro Val Ile Thr Ser Ile Ser Pro Ser Ser Gly Pro Leu Ser Gly Gly
 1           5           10           15
Thr Glu Ile Thr Ile Thr Gly Ser Asn Leu Gly Ser Gly Ser Glu Asp
      20           25           30
Ile Lys Val Thr Phe Gly Gly Thr Glu Cys Asp Val Ile Ser Ser Ser
      35           40           45
Ser Ser Thr Gln Ile Val Cys Lys Thr Pro Pro Val Ala Gly Gly Pro
      50           55           60
Ser Pro Pro Val Val Thr Val Ser Leu Asp Gly Asp Gly Leu Ser Ser
      65           70           75           80
Ser Pro Val Thr Phe Thr Tyr Val
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<210> 25
<211> 1776
<212> DNA
<213> Homo sapien

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atctttgatg gtttgaggtt ggggtgttctt taccccaaca atggctctca attggagata      180
cacctggtga acgtgaacat ggtggtgccc gcactgcgga gtgttccttg tgacgtcttt      240
cctgttttct tggatttgcc tgtggtgaca tgccggacca gatctgtgct gtctgaagca      300
catgagggtc tgtacttcct ggaagcatac ttcgggggac agctggtaag cagtccaaat      360
ccaggaccac gagatagctg tactttcaag ttttccaagg cgcagacacc catcggtcac      420
caagtttatc caccaagtgg tgttcaggga aaactaatac atgtatatgg ctggattatc      480
actggaagat tggaaacttt tgattttgat gctgagtaca ttgatagccc agtgatcttg      540
gaagctcaag gagacaaatg ggttactcct tgctctctta taaataggca gatgggaagc      600
tgttatccta ttcaggagga ccatggtctt gggactctgc agtgccatgt ggaaggcgac      660
tacatcggct ccagaaatgt tagcttctca gtatttaaca aaggaaagtc aatggtccac      720

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<210> 26

<211> 1871

<212> PRT

<213> Mus musculus

<400> 26

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 20          25          30
Val Thr Glu Val Ile Pro Lys Tyr Gly Ser Ile Asn Gly Ala Thr Arg
 35          40          45
Leu Thr Ile Lys Gly Glu Gly Phe Ser Gln Ala Ser Gln Phe Asn Tyr
 50          55          60
Gly Ala Asp Asn Thr Glu Leu Gly Asn His Val Gln Leu Val Ser Ser
 65          70          75          80
Phe Gln Ser Ile Thr Cys Asp Val Glu Lys Asp Ser Ser His Ser Thr
 85          90          95
Gln Ile Thr Cys Tyr Thr Arg Ala Met Pro Glu Asp Thr Tyr Ser Val
100         105         110
Arg Val Ser Val Asp Gly Val Pro Val Ala Glu Asn Asn Thr Cys Lys
115         120         125
Gly Val Ala Ser Ser Trp Ala Cys Ser Phe Ser Thr Lys Ser Phe Arg
130         135         140
Thr Pro Thr Ile Arg Ser Ile Thr Pro Leu Ser Gly Thr Pro Gly Thr
145         150         155         160
Leu Ile Thr Ile Lys Gly Arg Leu Phe Thr Asp Val Tyr Gly Ser Asn
165         170         175
Thr Ala Leu Ser Ser Asn Gly Arg Asn Val Arg Ile Leu Arg Ile Tyr
180         185         190
Ile Gly Gly Met Pro Cys Glu Leu Leu Ile Pro His Ser Asp Asp Leu
195         200         205
Tyr Gly Leu Lys Leu Asp His Ala Asn Gly Asp Thr Gly Ser Val Thr

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|   |   |     |  |     |
|---|---|-----|--|-----|
| 210   |   | 215 |  | 220 |
| Cys Lys Thr Thr Gly   | Thr Tyr Ile Gly His His Asn Val Ser Phe Ile |     |  |     |
| 225   | 230   | 235 |  | 240 |
| Leu Asp Ser Asp Tyr Gly Arg Ser Phe Pro Glu Lys Met Thr Tyr Phe |   |     |  |     |
|   | 245   | 250 |  | 255 |
| Val Ser Ser Leu Asn Lys Ile Ser Met Phe Gln Thr Tyr Pro Glu Val |   |     |  |     |
|   | 260   | 265 |  | 270 |
| Val Met Val Ser Pro Ser Lys Gly Ser Thr Glu Gly Gly Thr Leu Leu |   |     |  |     |
|   | 275   | 280 |  | 285 |
| Thr Ile His Gly His Phe Phe Asp Gln Thr Asp Leu Pro Val Arg Val |   |     |  |     |
|   | 290   | 295 |  | 300 |
| Leu Val Gly Gly Gln Ala Cys Ala Ile Leu Asn Val Thr Glu Asn Thr |   |     |  |     |
| 305   | 310   | 315 |  | 320 |
| Ile Tyr Cys Lys Thr Pro Pro Lys Pro His Ile Leu Lys Ala Thr Tyr |   |     |  |     |
|   | 325   | 330 |  | 335 |
| Pro Gly Gly Arg Gly Leu Lys Val Glu Val Trp Asn Asn Ser Arg Pro |   |     |  |     |
|   | 340   | 345 |  | 350 |
| Ala His Leu Glu Asp Ile Leu Glu Tyr Asn Glu His Thr Pro Gly Tyr |   |     |  |     |
|   | 355   | 360 |  | 365 |
| Met Gly Ala Thr Trp Thr Asp Ser Ala Ser Tyr Val Trp Pro Ile Glu |   |     |  |     |
|   | 370   | 375 |  | 380 |
| Gln Gly Thr Phe Val Ala Arg Ile Ser Gly Phe Leu Val Pro Pro Asp |   |     |  |     |
| 385   | 390   | 395 |  | 400 |
| Ser Asp Val Tyr Arg Phe Tyr Ile Arg Gly Asp Asp Arg Tyr Ala Ile |   |     |  |     |
|   | 405   | 410 |  | 415 |
| Tyr Phe Ser Gln Thr Gly Arg Thr Glu Asp Lys Val Arg Ile Ala Tyr |   |     |  |     |
|   | 420   | 425 |  | 430 |
| Tyr Ser Gly Asn Ala Asn Thr Tyr Phe Ser Asn Ser Thr Gln Arg Ser |   |     |  |     |
|   | 435   | 440 |  | 445 |
| Asp Glu Ile His Leu Gln Lys Gly Lys Glu Tyr Tyr Ile Glu Ile Leu |   |     |  |     |
|   | 450   | 455 |  | 460 |
| Leu Gln Glu Tyr Thr Leu Ser Ala Phe Val Asp Val Gly Leu Tyr Gln |   |     |  |     |
| 465   | 470   | 475 |  | 480 |
| Tyr Lys Asn Val Phe Thr Glu Gln Gln Thr Gly Asp Ala Leu Asn Glu |   |     |  |     |
|   | 485   | 490 |  | 495 |
| Glu Gln Val Ile Lys Ser Gln Ser Thr Val Val Pro Glu Val Gln Ile |   |     |  |     |
|   | 500   | 505 |  | 510 |
| Ile Thr Leu Glu Asn Trp Glu Thr Ala Asp Val Thr Asn Glu Val Gln |   |     |  |     |
|   | 515   | 520 |  | 525 |
| Gln Val Thr Val Thr Ser Pro Cys Val Gly Ala Asn Ser Cys Ser Leu |   |     |  |     |
|   | 530   | 535 |  | 540 |
| Ser Gln Tyr Arg Phe Ile Tyr Asn Met Glu Lys Thr Val Trp Leu Pro |   |     |  |     |
| 545   | 550   | 555 |  | 560 |
| Ala Asp Ala Ser Asp Phe Thr Leu Lys Ser Ala Leu Asn Asp Leu Trp |   |     |  |     |
|   | 565   | 570 |  | 575 |
| Ser Ile Lys Pro Asp Ser Val Gln Val Thr Ser Lys Arg Asp Leu Gln |   |     |  |     |
|   | 580   | 585 |  | 590 |
| Ser Tyr Ile Tyr Thr Ile Thr Phe Val Ser Thr Arg Gly Asp Phe Asp |   |     |  |     |
|   | 595   | 600 |  | 605 |
| Leu Leu Gly Tyr Glu Val Phe Glu Gly Ser Asn Val Thr Leu Ser Ile |   |     |  |     |
|   | 610   | 615 |  | 620 |
| Thr Glu Gln Thr Lys Gly Lys Pro Asn Leu Glu Thr Phe Thr Leu Asn |   |     |  |     |

|      |      |     |     |     |      |      |      |     |     |      |      |      |     |      |
|------|------|-----|-----|-----|------|------|------|-----|-----|------|------|------|-----|------|
| 625  |      |     |     |     | 630  |      |      |     |     | 635  |      |      |     | 640  |
| Trp  | Asp  | Gly | Ile | Ala | Ser  | Lys  | Pro  | Leu | Thr | Pro  | Glu  | Ser  | Ser | Glu  |
|      |      |     |     | 645 |      |      |      |     |     | 650  |      |      |     | 655  |
| Glu  | Phe  | Gln | Val | Ala | Val  | Glu  | Glu  | Met | Val | Ser  | Ala  | Lys  | Cys | Pro  |
|      |      |     | 660 |     |      |      |      | 665 |     |      |      |      | 670 |      |
| Glu  | Ile  | Ala | His | Leu | Glu  | Glu  | Gly  | Phe | Leu | Val  | Lys  | Tyr  | Phe | Arg  |
|      |      | 675 |     |     |      |      | 680  |     |     |      |      | 685  |     |      |
| Tyr  | Glu  | Thr | Asp | Phe | Glu  | Leu  | Glu  | His | Ile | Asn  | Arg  | Gly  | Gln | Lys  |
|      | 690  |     |     |     |      | 695  |      |     |     | 700  |      |      |     |      |
| Ala  | Glu  | Thr | Asp | Ala | Tyr  | Cys  | Gly  | Arg | Tyr | Ser  | Leu  | Lys  | Asn | Pro  |
| 705  |      |     |     | 710 |      |      |      |     | 715 |      |      |      |     | 720  |
| Val  | Leu  | Phe | Asp | Ser | Thr  | Asp  | Val  | Lys | Pro | Asn  | Lys  | Ser  | Pro | Tyr  |
|      |      |     | 725 |     |      |      |      |     | 730 |      |      |      |     | 735  |
| Asp  | Ile  | Leu | Leu | Phe | Pro  | Tyr  | Asn  | Gln | Leu | Cys  | Leu  | Ala  | Tyr | Lys  |
|      |      | 740 |     |     |      |      |      | 745 |     |      |      |      | 750 |      |
| Ser  | Leu  | Ala | Asn | Phe | Ile  | Asp  | Leu  | Lys | Phe | Lys  | Tyr  | Gln  | Asp | Ser  |
|      | 755  |     |     |     |      |      | 760  |     |     |      |      | 765  |     |      |
| Lys  | Ile  | Ile | Arg | Ser | Ala  | Asp  | Val  | Gln | Phe | Glu  | Tyr  | Asn  | Phe | Ala  |
|      | 770  |     |     |     |      | 775  |      |     |     |      | 780  |      |     |      |
| Gly  | Asn  | Lys | Trp | Thr | Tyr  | Thr  | Cys  | Ile | Asp | Leu  | Leu  | Asp  | Phe | Leu  |
| 785  |      |     |     |     | 790  |      |      |     |     | 795  |      |      |     | 800  |
| Thr  | Lys  | Tyr | Ala | Gly | Thr  | Ser  | Phe  | Ser | Leu | Gln  | Arg  | Ile  | Thr | Leu  |
|      |      |     | 805 |     |      |      |      |     | 810 |      |      |      |     | 815  |
| Lys  | Ser  | Ser | Glu | Phe | Gln  | Ser  | Ile  | Tyr | Val | Asp  | Ala  | Val  | Tyr | Ile  |
|      |      |     | 820 |     |      |      |      | 825 |     |      |      |      | 830 |      |
| Gln  | Thr  | Pro | Thr | Val | Ser  | Val  | Leu  | Asp | Asp | Met  | Pro  | Lys  | Arg | Arg  |
|      | 835  |     |     |     |      |      | 840  |     |     |      |      | 845  |     |      |
| Pro  | Ala  | Leu | Ala | Asn | Lys  | Gly  | Ile  | Phe | Leu | Lys  | His  | Phe  | Gln | Val  |
|      | 850  |     |     |     |      | 855  |      |     |     |      | 860  |      |     |      |
| Arg  | Thr  | Lys | Leu | Asn | Gly  | Ser  | Ala  | Met | Thr | Ile  | Gln  | Tyr  | Ser | Val  |
| 865  |      |     |     | 870 |      |      |      |     |     | 875  |      |      |     | 880  |
| Ile  | Thr  | Ser | Tyr | Asn | Cys  | Ser  | His  | Asn | Ile | Pro  | Met  | Met  | Ala | Val  |
|      |      |     | 885 |     |      |      |      |     | 890 |      |      |      |     | 895  |
| Phe  | Gly  | Gln | Ile | Ile | Thr  | Asn  | Glu  | Thr | Lys | Asn  | Glu  | Leu  | Val | Tyr  |
|      |      | 900 |     |     |      |      |      | 905 |     |      |      |      | 910 |      |
| Gly  | Asn  | Asn | Trp | Pro | Gly  | Glu  | Ser  | Lys | Ile | Arg  | Ile  | Gln  | Lys | Ile  |
|      | 915  |     |     |     |      |      | 920  |     |     |      |      | 925  |     |      |
| Glu  | Ala  | Ser | Pro | Pro | Ile  | Ser  | Gly  | Ser | Phe | Asp  | Val  | Gln  | Ala | Tyr  |
|      | 930  |     |     |     |      | 935  |      |     |     |      | 940  |      |     |      |
| His  | Thr  | Leu | Lys | Gly | Ile  | Pro  | Ala  | Ala | Val | Pro  | Ala  | Ala  | Asp | Leu  |
| 945  |      |     |     |     | 950  |      |      |     |     | 955  |      |      |     | 960  |
| Phe  | Ala  | Leu | Gln | Ser | Leu  | Glu  | Glu  | Ile | Glu | Gln  | Val  | Ser  | Val | Asn  |
|      |      |     | 965 |     |      |      |      |     | 970 |      |      |      |     | 975  |
| Glu  | Gly  | Thr | Cys | Ala | Gly  | Tyr  | Ser  | Trp | Ser | Ile  | Arg  | Trp  | Thr | Ser  |
|      |      | 980 |     |     |      |      | 985  |     |     |      |      |      | 990 |      |
| Arg  | Gly  | Lys | Gln | Pro | Leu  | Leu  | Gln  | Ile | Asn | Asp  | Ser  | Asn  | Ile | Ile  |
|      | 995  |     |     |     |      |      | 1000 |     |     |      |      | 1005 |     |      |
| Glu  | Lys  | Ala | Asn | Val | Thr  | Val  | Thr  | Thr | Ile | Lys  | Glu  | Gly  | Gly | Leu  |
|      | 1010 |     |     |     |      | 1015 |      |     |     |      | 1020 |      |     |      |
| Arg  | Gln  | Arg | Ile | Pro | Gly  | Asp  | Met  | Leu | Arg | Thr  | Leu  | Asn  | Gln | Gln  |
| 1025 |      |     |     |     | 1030 |      |      |     |     | 1035 |      |      |     | 1040 |
| Gln  | Val  | Glu | Val | Tyr | Leu  | Asn  | Gly  | Ile | Pro | Ala  | Lys  | Cys  | Ser | Gly  |

|   |      |      |      |      |      |
|---|------|------|------|------|------|
|   | 1045 |      | 1050 |      | 1055 |
| Cys Gly Phe Thr Trp Asp Ala Met Ile Thr Pro Leu Ile Leu Thr Thr |      |      |      |      |      |
|   | 1060 |      | 1065 |      | 1070 |
| Thr Pro Ser Glu Gly Ser Tyr Ala Glu Ser Thr Ile Leu Thr Ile Ala |      |      |      |      |      |
|   | 1075 |      | 1080 |      | 1085 |
| Gly Ser Gly Phe Ser Pro Thr Ser Ala Val Ser Val Ser Val Gly Ser |      |      |      |      |      |
|   | 1090 |      | 1095 |      | 1100 |
| Thr Arg Cys Ser Leu Leu Ser Val Glu Glu Asn Glu Ile Lys Cys Gln |      |      |      |      |      |
| 1105  |      | 1110 |      | 1115 | 1120 |
| Ile Val Asn Gly Ser Ala Gly His Val Pro Val Ala Val Ser Ile Ala |      |      |      |      |      |
|   | 1125 |      | 1130 |      | 1135 |
| Asp Val Gly Leu Ala Gln Asn Leu Glu Gly Glu Gly Ser His Phe Ile |      |      |      |      |      |
|   | 1140 |      | 1145 |      | 1150 |
| Tyr Arg Ser Gln Ile Ser His Val Trp Pro Asp Ser Gly Ser Leu Ala |      |      |      |      |      |
|   | 1155 |      | 1160 |      | 1165 |
| Gly Gly Thr Leu Leu Thr Ile Ser Gly Phe Gly Phe Ser Glu Asn Ser |      |      |      |      |      |
|   | 1170 |      | 1175 |      | 1180 |
| Thr Val Leu Val Gly Asn Glu Thr Cys Asn Val Ile Glu Gly Asp Leu |      |      |      |      |      |
| 1185  |      | 1190 |      | 1195 | 1200 |
| Asn Arg Ile Thr Cys Arg Thr Ser Lys Arg Ile Glu Gly Thr Val Asp |      |      |      |      |      |
|   | 1205 |      | 1210 |      | 1215 |
| Ile Ser Val Ile Thr Asn Gly Ile Gln Val Thr Ala Lys Asp Ser Phe |      |      |      |      |      |
|   | 1220 |      | 1225 |      | 1230 |
| Ser Tyr Ser Cys Leu Gln Thr Pro Val Val Thr Asp Phe Ser Pro Lys |      |      |      |      |      |
|   | 1235 |      | 1240 |      | 1245 |
| Glu Arg Thr Val Leu Gly Lys Val Asn Leu Thr Ile Lys Gly Tyr Asn |      |      |      |      |      |
|   | 1250 |      | 1255 |      | 1260 |
| Phe Gly Asn Glu Leu Ala Gln Asn Thr Val Tyr Val Gly Arg Lys His |      |      |      |      |      |
| 1265  |      | 1270 |      | 1275 | 1280 |
| Cys Gln Val Leu His Ser Asn Phe Thr Asp Ile Thr Cys Leu Leu Pro |      |      |      |      |      |
|   | 1285 |      | 1290 |      | 1295 |
| Thr Leu Pro Pro Gly Lys His Asp Ile Tyr Val Lys Val Arg Asn Trp |      |      |      |      |      |
|   | 1300 |      | 1305 |      | 1310 |
| Gly Leu Ala Ser Thr Arg Asn Lys Leu Asn Ala Ser Ile Leu Tyr Ile |      |      |      |      |      |
|   | 1315 |      | 1320 |      | 1325 |
| Leu Glu Val Ile His Met Phe Pro Gln Arg Gly Ser Leu Tyr Gly Gly |      |      |      |      |      |
|   | 1330 |      | 1335 |      | 1340 |
| Thr Glu Ile Thr Ile Met Gly Phe Gly Phe Ser Thr Ile Pro Thr Glu |      |      |      |      |      |
| 1345  |      | 1350 |      | 1355 | 1360 |
| Asn Ser Val Leu Leu Gly Ser Phe Pro Cys Asp Ile Thr Ser Ser Ser |      |      |      |      |      |
|   | 1365 |      | 1370 |      | 1375 |
| Glu Asn Val Ile Lys Cys Thr Leu His Ser Thr Gly Thr Val Phe Arg |      |      |      |      |      |
|   | 1380 |      | 1385 |      | 1390 |
| Ile Thr Asn Asn Gly Ser His Leu Val His Gly Leu Gly Tyr Ala Trp |      |      |      |      |      |
|   | 1395 |      | 1400 |      | 1405 |
| Ser Pro Ser Val Leu Asn Val Thr Val Gly Asp Thr Val Val Trp Ser |      |      |      |      |      |
|   | 1410 |      | 1415 |      | 1420 |
| Trp Gln Ala His Pro Phe Leu Arg Gly Ile Gly Tyr Arg Ile Phe Ser |      |      |      |      |      |
| 1425  |      | 1430 |      | 1435 | 1440 |
| Val Ser Ser Pro Gly Ser Val Thr Tyr Asp Asp Lys Gly Phe Thr Asn |      |      |      |      |      |
|   | 1445 |      | 1450 |      | 1455 |
| Gly Arg Gln Lys Ser Ala Ser Gly Ser Phe Ser Tyr Gln Phe Thr Ser |      |      |      |      |      |

|   |      |      |      |
|---|------|------|------|
| Pro Gly Ile Tyr Tyr Tyr Ser Ser Gly Tyr Val Asp Glu Ala His Ser | 1460 | 1465 | 1470 |
| Ile Ser Leu Gln Gly Val Ile Asn Val Phe Pro Ala Glu Ala Arg His | 1475 | 1480 | 1485 |
| Ile Pro Leu Tyr Leu Phe Val Gly Asn Ile Glu Ala Thr Tyr Val Pro | 1490 | 1495 | 1500 |
| Ala Gly Pro Ala His Leu Gln Leu Ala Ser Thr Ala Ala Gly Cys Leu | 1505 | 1510 | 1515 |
| Ala Thr Glu Pro Leu Cys Gly Leu Asn Asp Thr Arg Val Lys His Ser | 1525 | 1530 | 1535 |
| Asn Lys Leu Phe Phe Glu Leu Ser Asn Cys Ile Ser Pro Ser Ile Ile | 1540 | 1545 | 1550 |
| Asn Ile Thr Pro Ser Thr Gly Thr Ala Asn Glu Leu Ile Thr Ile Ile | 1555 | 1560 | 1565 |
| Gly His Gly Phe Ser Ser Leu Pro Cys Ala Asn Lys Val Thr Ile Gly | 1570 | 1575 | 1580 |
| Ser Tyr Pro Cys Val Val Glu Glu Ser Ser Glu Asn Ser Ile Ile Cys | 1585 | 1590 | 1595 |
| His Ile Asp Pro Gln Asn Ser Met Asn Val Gly Ile Arg Glu Ile Val | 1605 | 1610 | 1615 |
| Thr Leu Ile Val Tyr Asn Leu Gly Thr Ala Ile Asn Thr Leu Thr Lys | 1620 | 1625 | 1630 |
| Ala Phe Asp Arg Arg Phe Val Leu Leu Pro Asn Ile Asp Met Val Met | 1635 | 1640 | 1645 |
| Pro Lys Ala Gly Ser Thr Thr Gly Met Thr Arg Val Thr Ile Gln Gly | 1650 | 1655 | 1660 |
| Ser Gly Phe Met Ser Ser Pro Glu Gly Val Glu Val Phe Met Gly Asp | 1665 | 1670 | 1675 |
| Phe Pro Cys Lys Val Leu Ser Val Thr Tyr Thr Ala Leu Asn Val Glu | 1685 | 1690 | 1695 |
| Thr Ser Pro Ala Pro Gln Gln Leu Val Leu Val Asp Ile Leu Ile His | 1700 | 1705 | 1710 |
| Gly Val Pro Ala Gln Cys Gln Ser Asn Cys Ser Phe Ser Tyr Leu Glu | 1715 | 1720 | 1725 |
| Asn Ile Ala Pro Tyr Val Thr Gly Ile Phe Pro Asn Ser Ile Gln Gly | 1730 | 1735 | 1740 |
| Tyr Gly Asn Val Leu Ile Lys Gly Glu Arg Phe Gly Thr Val Leu Glu | 1745 | 1750 | 1755 |
| Glu Ile Ser Ile Phe Ile Gly Ser Gln Gln Phe Arg Val Ile Asp Val | 1765 | 1770 | 1775 |
| Asn Glu Asn Asn Ile Thr Val Leu Met Thr Pro Leu Glu Ala Gly Leu | 1780 | 1785 | 1790 |
| His Ser Leu Ser Val Val Val Gly Ser Lys Gly Leu Ala Leu Gly Asn | 1795 | 1800 | 1805 |
| Leu Thr Ile Ser Ser Pro Ala Val Ala Ser Val Ser Pro Thr Ser Gly | 1810 | 1815 | 1820 |
| Ser Ile Ala Gly Gly Thr Thr Leu Met Ile Thr Gly Asn Gly Phe Ser | 1825 | 1830 | 1835 |
| Pro Gly Asn Thr Thr Val Thr Val Gly Asp Gln Pro Cys Gln Ile     | 1845 | 1850 | 1855 |
|   | 1860 | 1865 | 1870 |



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 ctggttcatc agatcaacct tctccctctg gccaggaga cgggcctgtt ctatgtggat 180  
 gaaattatta ttgcagacac aaacgtaaca gtttctcaag ctgattctgg aacggctcgc 240  
 ccagggggca atctggtgga atcagtctct gtggtgggat cccctccggt ctacagtgtc 300  
 acctcctggc tggcgggggtg tggcacggag ctcccgtca tcaactgcacg ctctgtgccc 360  
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<210> 28  
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 tggatatg 188

<210> 29  
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 Ile Lys Glu Gly Asp Met Leu Arg Leu Thr Ser Asp Ala Thr Val His  
 20 25 30  
 Ser Ile Val Ile Gln Asp Gly Gly Leu Leu Val Phe Gly Asp Asn Lys  
 35 40 45  
 Asp Gly Ser Arg Asn Ile Thr Leu Arg Thr His Tyr Ile Leu Ile Gln  
 50 55 60  
 Asp Gly Gly Ala Leu His Ile Gly Ala Glu Lys Cys Arg Tyr Lys Ser  
 65 70 75 80  
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 35 40 45  
 Glu Pro Ile Val Leu Arg Thr Arg His Ile Leu Ile Asp Asn Gly Gly  
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| Ser | Ile | Val | Ala | Leu | Asn | Lys | Ser | Tyr | Glu | Val | Tyr | Phe | Thr | Gly | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ser | Pro | Gln | Asn | Leu | Arg | Leu | Met | Leu | Leu | Asn | Val | Asp | His | Asn | Lys |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Val | Leu | Val | Gly | Ile | Phe | Phe | Ser | Thr | Leu | Gln | Arg | Leu | Asp | Val |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Tyr | Val | Asn | Asn | Leu | Leu | Val | Cys | Pro | Lys | Thr | Thr | Ile | Trp | Asn | Ala |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gln | Gln | Lys | His | Cys | Glu | Leu | Asn | Asn | His | Leu | Tyr | Lys | Asp | Gln | Phe |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Leu | Pro | Asn | Leu | Asp | Ser | Thr | Val | Leu | Gly | Glu | Asn | Tyr | Phe | Asp | Gly |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Thr | Tyr | Gln | Met | Leu | Tyr | Leu | Leu | Val | Lys | Gly | Thr | Ile | Pro | Val | Glu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ile | His | Thr | Ala | Thr | Val | Ile | Phe | Val | Ser | Phe | Gln | Leu | Ser | Val | Ala |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Glu | Asp | Asp | Phe | Tyr | Thr | Ser | His | Asn | Leu | Val | Lys | Asn | Leu | Ala |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Leu | Phe | Leu | Lys | Ile | Pro | Ser | Asp | Lys | Ile | Arg | Ile | Ser | Lys | Ile | Arg |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Gly | Lys | Ser | Leu | Arg | Arg | Lys | Arg | Ser | Met | Gly | Phe | Ile | Ile | Glu | Ile |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Glu | Ile | Gly | Asp | Pro | Pro | Ile | Gln | Phe | Ile | Ser | Asn | Gly | Thr | Thr | Gly |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Gln | Met | Gln | Leu | Ser | Glu | Leu | Gln | Glu | Ile | Ala | Gly | Ser | Leu | Gly | Gln |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ala | Val | Ile | Leu | Gly | Asn | Ile | Ser | Ser | Ile | Leu | Gly | Phe | Asn | Ile | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ser | Met | Ser | Ile | Thr | Asn | Pro | Leu | Pro | Ser | Pro | Ser | Asp | Ser | Gly | Trp |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |
| Ile | Asn | Val | Thr | Ala | Gln | Pro | Val | Glu | Arg | Ser | Ala | Phe | Pro | Val | His |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| His | Val | Ala | Phe | Val | Ser | Ser | Leu | Leu | Val | Ile | Thr | Gln | Pro | Val | Ala |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ala | Gln | Pro | Gly | Gln | Pro | Phe | Pro | Gln | Gln | Pro | Ser | Val | Lys | Ala | Thr |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Asp | Ser | Asp | Gly | Asn | Cys | Val | Ser | Val | Gly | Ile | Thr | Ala | Leu | Thr | Leu |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Arg | Ala | Ile | Leu | Lys | Asp | Ser | Asn | Asn | Asn | Gln | Val | Asn | Gly | Leu | Ser |
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|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Leu | Thr | Pro | Leu | Arg | Thr | Gly | Lys | Asn | Tyr | Lys | Ile | Glu | Phe | Ile | Leu |
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| ttgggtgtatt | tgggagtgtt | aaggagttag  | tcagcctacc  | ccaaaaggca  | aaagaacatt | 1500 |
| ttgacttcta  | tagtaagtgt | tgcagggtat  | gtccctttta  | ctgccatttt  | gaggaaccac | 1560 |
| aagccaggta  | gtaactaatt | ttccattccc  | tctctcatta  | atctctttta  | aatctaaaaa | 1620 |
| ttttaaatta  | aaaaattaaa | atattcattt  | attggtaagt  | taatataatt  | atattgtgga | 1680 |
| cttttaaagt  | agttatgttt | gaagctattt  | ttaggataga  | aattatctca  | aaaataaaga | 1740 |
| taatgtatgt  | acattaaagc | aaaattttaa  | aacatcttta  | tattgatcat  | ctgaagattt | 1800 |
| aagaaaatag  | cattatcaga | aaatattctt  | ggtattttatt | tacagagtct  | aatcagttct | 1860 |
| ttaactatat  | ctgcctataa | tattaggttg  | ctggaattta  | aatattaaaa  | atattatctt | 1920 |
| ttaaaaaatg  | ttttatgaaa | ttgcctgtaa  | tcttcttcaa  | agttgcattt  | gatgggtttt | 1980 |
| aatttgaaat  | tgttgacatt | ttgaattgac  | gcttatctgt  | ggatcataat  | atttttaatt | 2040 |
| agaaaaatgc  | tctctgcagg | tggtgaggta  | gctggtaagc  | tcagagcaaa  | ttctcataag | 2100 |
| caatctgtct  | ttatttctaa | taataagaat  | agtatttact  | atagattgag  | cttctaccat | 2160 |
| gatccagggc  | ttgcaatagc | tgtgttaggt  | ggttttgtca  | gctaagcttc  | cgtatagctg | 2220 |
| tgtgctgtgg  | ctacaacttt | cccaaactg   | acacaacagc  | aagggtatct  | gtgtccagtg | 2280 |
| tagagatgta  | ttgggctact | gagactaggc  | aggtgctata  | tctctttcta  | gaatattctg | 2340 |
| gacaattgtg  | tggcataaga | atcaggttgt  | tcttctttat  | taccataaaa  | gaagacaaag | 2400 |
| tacaagggca  | gtcatttgtt | ggttcagtga  | ttcaggcctt  | ggttactctt  | gcttgactct | 2460 |
| atgttctact  | ttacag     |             |             |             |            | 2476 |

&lt;210&gt; 212

&lt;211&gt; 1537

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 212

|             |             |             |            |            |            |      |
|-------------|-------------|-------------|------------|------------|------------|------|
| gtaaggagtg  | gctttttttac | acctgtccct  | tctcctaaga | atgcttggtg | gccttgaggg | 60   |
| acacagggtg  | gactttttttc | aggaaaagct  | acctgtcctg | ttgcttaaag | caatgttctc | 120  |
| aatcttgaga  | atgcagcacc  | agattcacct  | ggaagtattg | ttaaaattac | tgggcctact | 180  |
| gtcagagttt  | ctaaggcagt  | aggtttggg   | aaaaacctga | caatttgcat | ttttaataag | 240  |
| ttccttggtg  | atgctgattc  | tgctgggtctg | gggactacgc | tttgagaact | aattccgagt | 300  |
| cagttagttt  | aaaaatagtg  | gcattttgtg  | ctgttcagag | gttcacatca | ccactgtttt | 360  |
| gttttggtg   | tgttcttttc  | attgcattcc  | tcattgtgta | atcttggtga | aatcctttga | 420  |
| aatgaaatgt  | ctagagaaga  | aaaatagcta  | tttctaagaa | ctcaccacca | gatggcacta | 480  |
| aagccccata  | agcattgctt  | cataataacc  | atttctagcc | acagtttaca | aagcagtaac | 540  |
| taaggatcag  | gcttcttcta  | agcttctgga  | acacatgtat | actctaattt | gttcttttaa | 600  |
| tttttcacct  | aaaccccgat  | agaatgggaa  | gaattgagtg | ctctgccttt | gatgtatgta | 660  |
| tatgtatatg  | tgggtgtagg  | gatatatata  | ttcacagtgt | atatatgtgt | atacacatat | 720  |
| atgtctaaat  | atacagtcac  | gcaccacata  | acaatgtatc | tgctcgggtg | ggaccaaata | 780  |
| tatgatgggtg | gtcctataag  | attatactac  | catattttta | ctgtagcttt | tgtatgttta | 840  |
| gatatgtttg  | gatacacaaa  | tatgtagcat  | tgtgttacaa | ttgcctacag | tattcagtac | 900  |
| agcagcaggc  | ttgtagccta  | ggagcaacag  | gctataccat | atagcctagg | tgtgtggtag | 960  |
| gctgtacat   | ctaggtttgt  | gtaagtaaac  | tgcatgatgg | ttgcacaatg | atgagactgt | 1020 |
| ctaaggatgc  | atttctttaa  | atgtatcctc  | actgttaagt | gatgcataac | tgtataggtt | 1080 |
| tctttctctc  | atctttttct  | catatgttcc  | aaaatgagtt | ctcgtaccta | cagcatgctg | 1140 |
| caatggcata  | ttaaaggcag  | gtgcagaaag  | tttgaaccgg | tgctttactt | tccttgacta | 1200 |
| aatgttttgt  | ccatggctct  | ctgggcagga  | aaagcaataa | aaccatccat | tgaaaatgaa | 1260 |
| gaggtgagac  | atcttcagtg  | gcagagagga  | agcccacat  | atcggtaggc | tctaaatgcc | 1320 |
| aacgttttta  | ctcttgaaat  | gatagacacg  | aattaaagta | ctctgaaatg | attctcacat | 1380 |
| cgagtgttcc  | tgaaaactcc  | cttactgagt  | ttcctcaggt | cccttagctc | tttctggaag | 1440 |
| gctgcagcct  | aagcaagaca  | ggacatcctt  | cagacaaggt | cctcctaggt | gcacacccca | 1500 |
| accagacgt   | taatactttg  | tttctgacgt  | gccacag    |            |            | 1537 |

&lt;210&gt; 213

&lt;211&gt; 2303

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 213

|            |            |             |            |             |             |      |
|------------|------------|-------------|------------|-------------|-------------|------|
| gtaaaggggt | gattgggggt | gcaacaattc  | tcactcacat | attctcactc  | acattcccaa  | 60   |
| gggaacaaca | tcctggggag | ttgtcagaca  | ggtgataata | ttaaagctat  | tttattttatt | 120  |
| ttccagtgtc | tgaaagtgac | attctttaaag | tgaaagattt | ggaaagggac  | ttattgttaa  | 180  |
| tgctacccca | acctttacat | tttgtagatg  | cggaaagtgt | atagtgtgg   | aaactgagtg  | 240  |
| gatcagcttc | ctgggactgt | tgtaaggagt  | taaccacaaa | cttgggtggc  | tcaaacagca  | 300  |
| aaaaatgatt | ctccccagt  | tctggggcca  | gaagtccaaa | atcaagttgt  | cggcagggcc  | 360  |
| acactcctgt | gaagtatttg | ctcctgcctc  | ttctggcttc | tggtgggtgg  | tagcatgtct  | 420  |
| tggctgtggc | catatcactc | caaccaccgc  | ctctgtggtc | acgttgcttc  | ttcctcttct  | 480  |
| atctcaaaat | tttctctgcc | tctctcttat  | aagggtacct | attatataat  | tgtatttagg  | 540  |
| gtccacctgg | gataatctag | gacagatttt  | tcctctcaag | acccttagcc  | acatcttttg  | 600  |
| ccatatgcag | tttattattt | tgctttataa  | gttaacattc | atattttctg  | gggattaggc  | 660  |
| cattaggcca | tcttttaggg | ggttcaccgt  | tcagccaact | acactgaagc  | ttgccaaaag  | 720  |
| gtcatacaaa | tagctgatga | caggggccag  | ttgtgaaccc | aggtatttga  | ttcctgggtc  | 780  |
| agtcctcttc | tttctagagt | tttatagacc  | aagatacatg | gtagccatgg  | tccgtcagag  | 840  |
| ttagacttaa | tggtgacacc | atgtactatg  | gaggatttca | gtgggtccca  | caaagttaga  | 900  |
| aagaactttc | agatgcaatt | agagttagtg  | ttgtaaatct | tcaagaatac  | atacaatgca  | 960  |
| caaagaacaa | agattagaag | tgataatgat  | acgttactta | tttggttagaa | acatggggaa  | 1020 |
| tcagaagcaa | ggctcagtag | aacttgagag  | gggctgtata | aaagttggaa  | catgggtccaa | 1080 |
| aagtcttttg | ccctcccaag | cagaaagtcc  | ctaggcctgc | acaggacctt  | cttgggtgag  | 1140 |

|            |            |             |            |             |             |      |
|------------|------------|-------------|------------|-------------|-------------|------|
| aggaacagag | tggtattttt | attataatag  | ggtgactcag | gagaagtcga  | agatccctag  | 1200 |
| gtgttgattc | tggtaaatgg | gggaaaaaac  | atcaatcgtg | ccctgcctct  | atgaggctca  | 1260 |
| ttactgtgct | atztatattt | gattttactt  | ctcatggaag | acagctcatc  | cgtagagact  | 1320 |
| tcctgctact | gatttctatc | actgatgatc  | ctcagatcac | cgcctgcaaa  | acaactggga  | 1380 |
| aagtcagcct | tggcctggcc | ttttgaatga  | tgatggatct | gaaactctgt  | ataaatgtag  | 1440 |
| aaacatgatt | tgtaaaagga | taacaatttc  | gtttgcaatt | tagaaacgca  | gtgatatttt  | 1500 |
| attagccctt | cagggcagcg | tgggaattcaa | gagaaatgct | cttgagtagg  | tagaaggcaa  | 1560 |
| cctgtgtttt | catgtaaacc | tgtctttctg  | cattggcaag | cttctgcata  | tggttgggtt  | 1620 |
| tcattttctt | catccctaaa | gtagacatta  | ggatacccaa | tgaccacact  | cacagggctg  | 1680 |
| ctgggagcag | ctaataaaat | gggaacttct  | ggtagagcac | aaagcagggg  | tcaaatacag  | 1740 |
| agagctgtta | ttcttctgtg | gggacatgga  | atggggaagc | aggtgggttg  | gcttaaagaa  | 1800 |
| aattctaata | gagaaactga | agttaaatgc  | caacattcct | cagctgggct  | ggccaagttt  | 1860 |
| ttatgggtgt | cagctgctgt | acgcctccct  | cactccctgt | gaaaagtggc  | caatttttct  | 1920 |
| ctgttcacag | ggccagctaa | atttttccag  | ggaagatcta | atattttaatt | atgcttttcag | 1980 |
| gcattacaag | ggtgtgtgga | gtttacattt  | tgagttgaca | gttgagatgg  | ttttatctga  | 2040 |
| catggctgtg | ctctctgatt | gctgtgtgat  | atggtatgag | tgaaagatag  | tgtaataata  | 2100 |
| aaagtgggca | tctacttgtc | tttaccttag  | gaaaaaatgg | tttaattatg  | gctggggatt  | 2160 |
| ctactgaagt | tctactttga | cagaagggtc  | tcctgaaaat | ttgataggca  | tcctagtatg  | 2220 |
| tatcgtgtta | tccttgagga | tgaaactctg  | taaggtggat | taattagtgt  | ctgtgttttc  | 2280 |
| tgtatcaaaa | ccttctctca | cag         |            |             |             | 2303 |

&lt;210&gt; 214

&lt;211&gt; 2303

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 214

|            |             |             |             |             |             |      |
|------------|-------------|-------------|-------------|-------------|-------------|------|
| gtaaaggggt | gattgggggt  | gcaacaattc  | tcactcacat  | attctcactc  | acattcccaa  | 60   |
| gggaacaaca | tcctgggagg  | ttgtcagaca  | ggtgataata  | ttaaagctat  | tttattttatt | 120  |
| ttccagtgtc | tgaaagtgtg  | attcttaaag  | tgaaagattt  | ggaaaggggac | ttattgttaa  | 180  |
| tgctacccca | acctttacat  | tttgtagatg  | cggaaagatgt | atagttgtgg  | aaactgagtg  | 240  |
| gatcagcttc | ctgggactgt  | tgtaaggagt  | taaccacaaa  | cttggtggct  | tcaaacagca  | 300  |
| aaaaatgatt | ctccccagt   | tctggggcca  | gaagtccaaa  | atcaagttgt  | cggcaggggc  | 360  |
| acactcctgt | gaagtatttg  | ctcctgcctc  | ttctggcttc  | tggtgggtggc | tagcatgtct  | 420  |
| tggctgtggc | catatcactc  | caaccaccgc  | ctctgtggtc  | acgttgcttc  | ttcctcttct  | 480  |
| atctcaaaat | tttctctgcc  | tctctcttat  | aagggtagct  | attatataat  | tgtattttagg | 540  |
| gtccacctgg | gataatctag  | gacagatttt  | tcctctcaag  | acccttagcc  | acatcttttg  | 600  |
| ccatatgcag | tttattattt  | tgctttataa  | gttaacattc  | atattttctg  | gggatttaggc | 660  |
| cattaggcca | tcttttaggg  | ggttcaccgt  | tcagccaact  | acactgaagc  | ttgccaaaag  | 720  |
| gtcatacaaa | tagctgatga  | caggggccag  | ttgtgaacct  | aggtatttga  | ttcctgggtc  | 780  |
| agtcctcttc | tttctagagt  | tttatagacc  | aagatacatg  | gtagccatgg  | tccgtcagag  | 840  |
| ttagacttaa | tgggtgacacc | atgtactatg  | gaggatttca  | gtgggtcccaa | caaagttaga  | 900  |
| aagaactttc | agatgcaatt  | agagttagtgt | ttgtaaatct  | tcaagaatac  | atacaatgca  | 960  |
| caaagaacaa | agattagaag  | tgataatgat  | acgttactta  | tttggttagaa | acatggggaa  | 1020 |
| tcagaagcaa | ggctcagtag  | aacttgagag  | gggctgtata  | aaagttggaa  | catgggtccaa | 1080 |
| aagtcttttg | ccctcccaag  | cagaaagtcc  | ctaggcctgc  | acaggacctt  | cttgggtgag  | 1140 |
| aggaacagag | tggtattttt  | attataatag  | ggtgactcag  | gagaagtcga  | agatccctag  | 1200 |
| gtgttgattc | tggtaaatgg  | gggaaaaaac  | atcaatcgtg  | ccctgcctct  | atgaggctca  | 1260 |
| ttactgtgct | atztatattt  | gattttactt  | ctcatggaag  | acagctcatc  | cgtagagact  | 1320 |
| tcctgctact | gatttctatc  | actgatgatc  | ctcagatcac  | cgcctgcaaa  | acaactggga  | 1380 |
| aagtcagcct | tggcctggcc  | ttttgaatga  | tgatggatct  | gaaactctgt  | ataaatgtag  | 1440 |
| aaacatgatt | tgtaaaagga  | taacaatttc  | gtttgcaatt  | tagaaacgca  | gtgatatttt  | 1500 |

|            |            |            |            |            |            |      |
|------------|------------|------------|------------|------------|------------|------|
| attagccctt | cagggcagcg | tggaattcaa | gagaaatgct | cttgagtagg | tagaaggcaa | 1560 |
| cctgtgtttt | catgtaaacc | tgtctttctg | cattggcaag | cttctgcata | tggttggtt  | 1620 |
| tcattttctt | catccctaaa | gtagacatta | ggatacccaa | tgaccacct  | cacagggctg | 1680 |
| ctgggagcag | ctaataaaat | gggaacttct | ggtagagcac | aaagcagggg | tcaaatacag | 1740 |
| agagctgtta | ttcttctgtg | gggacatgga | atggggaagc | aggtggttgg | gcttaaagaa | 1800 |
| aattctaata | gagaaactga | agttaaatgc | caacattcct | cagctgggct | ggccaagttt | 1860 |
| ttatgggtgt | cagctgctgt | acgcctccct | cactccctgt | gaaaagtggc | caatttttct | 1920 |
| ctgttcacag | ggccagctaa | atttttccag | ggaagatcta | atatttaatt | atgctttcag | 1980 |
| gcattacaag | ggtgtgtgga | gtttacattt | tgagttgaca | gttgagatgg | ttttatctga | 2040 |
| catggctgtg | ctctctgatt | gctgtgtgat | atggtatgag | tgaaagatag | tgtaataata | 2100 |
| aaagtgggca | tctacttgtc | tttaccttag | gaaaaaatgg | tttaattatg | gctggggatt | 2160 |
| ctactgaagt | tctactttga | cagaagggtc | tcctgaaaat | ttgataggca | tcctagtatg | 2220 |
| tatcgtgtta | tccttgagga | tgaaactctg | taagggtgat | taattagtgt | ctgtgttttc | 2280 |
| tgtatcaaaa | ccttctctca | cag        |            |            |            | 2303 |

<210> 215  
 <211> 1629  
 <212> DNA  
 <213> Homo sapien

|             |   |      |
|-------------|---|------|
| <400> 215   |   |      |
| gtaagtcaag  | caaataagac agcacacttt ctttatgtaa atgaattggg agtccttttc 60   |      |
| acttctggaa  | agtagaaaat taacacaatc tgcctgatgg aaggaaagag aagcccactg 120  |      |
| gcttcttaca  | atcccaattc ctctctgagg cttgtctttg ttatgctctg tttatgaaga 180  |      |
| ttttttttat  | ttttatcaag gaaactgtgc atattctcta aatgtttgat tgtattttta 240  |      |
| tttgatgcat  | taactggatt tgtattttta attaaataac accatttgta agagctcata 300  |      |
| atltgatcat  | ttaagaacgt aaatgccttc acctagtttt agaccctatc tgccaatttg 360  |      |
| cgttgtttaa  | aattttattaa gtatgattaa atttttatca ttttgtaata tttcacaggt 420 |      |
| ggactcatat  | ttcaacaata ataagccaaa tgcacagaac aattaaattg gttggactgt 480  |      |
| tttctccgtt  | tagatatacc aaaaattgcc tagcctttcc ctccagtga gaaaagcttt 540   |      |
| caattttctat | tcacttaaag ccttggttgca cttgagatag ttcaaatttg gttgtgattt 600 |      |
| agaaagtaag  | gaaaaaaact atagaaacag aatcttagac tgttggagta ctaactaaga 660  |      |
| catttcttag  | aaaaaatttg gtctcagctt ggtggaacac tgtggggact aggatttggc 720  |      |
| tctagtctat  | cactaatttt gctaatttat gcttgacttt tctgagactc agcttcctta 780  |      |
| tttgataaag  | gcactactcc ctaagattcc atgttttttt atgatggaag agcagggaaa 840  |      |
| taagaaatgc  | atcttaaac aaagcatta tttttgagtt agtcaagtgg ctaagtacca 900    |      |
| cctagacctg  | gtatgaaggc agtagtgagg ggaactctgt atctcagtgt aaactagaaa 960  |      |
| tgtggactgg  | ttttactcat acaaattgcc caaaacatgt acagttattg catcactatt 1020 |      |
| aacaatagca  | aaagaggaga aaaaatggaa atttcaataa ataggaaaat tgtcaaataa 1080 |      |
| attgtagcag  | ggccctataa tggaattcta agtagctact aaaatgaact ggatccatag 1140 |      |
| agttttgaaa  | aaacatctat gctatacttt gaagcaaaaa agcaagttcc agaataatat 1200 |      |
| ggatagaata  | atgctttgaa tcagaaacat agatgcttaa aaattctgga aggagccata 1260 |      |
| agaaactcta  | tacctgggta cctccgggga gggagtcaga tggttggggg aatttttatt 1320 |      |
| ttcattttat  | ggctctttga ataaaaagtt taaaaactat aaataagcat taattttcca 1380 |      |
| tataaaaaatt | gttacattaa aaaaaaacct ctttaacaca ataggatatt gaatgtgatt 1440 |      |
| ggagtcagac  | aaggccagag cctaagtgga gaggaaactg aggccagcag ccacctcaag 1500 |      |
| ccagttgtgc  | ggattctgag gatgtgaaaa gaagaatggg tagtgaggaa gcaaatgttt 1560 |      |
| gaattttgag  | ttgagtaaag aagggagatt tgcctgtatg atcaagaact tgtacctttg 1620 |      |
| tctttaaag   |   | 1629 |

<210> 216  
 <211> 5171

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 216

|             |             |             |             |             |            |      |
|-------------|-------------|-------------|-------------|-------------|------------|------|
| gtgagtaaag  | atgccacaca  | catatatat   | aaagcatata  | tatggaaatg  | atattctttg | 60   |
| gttaattcta  | tttttgtgat  | taatgctgta  | ctgactacta  | atttctctat  | gtgtgcctag | 120  |
| gaaaagaatt  | tctctactcc  | tcatctaaaa  | tgatagttag  | aatctgaggc  | cacctgttaa | 180  |
| aatgattcat  | cataactttt  | gtcatattaa  | tatgtcaatg  | ttagatgaat  | attgaaacac | 240  |
| ttatcacctg  | tgttcttaac  | tgcatgttta  | ggatgacaga  | ggaagtaatt  | ctgaattctg | 300  |
| aatattagtt  | tcaatgacag  | ctataggagt  | catggaggaa  | acaagctctt  | ggctttgttc | 360  |
| tgaggtgagg  | ttgctgaaga  | catctgctta  | ttggaggtag  | cagtaaaggg  | atggagattt | 420  |
| tcaagctgga  | tatcacttga  | aaattagctt  | tgtgtgttca  | gttttcggtt  | tcttattata | 480  |
| ggcaaaagag  | ccaacactca  | tgttgtcttc  | ttgttttgca  | atactcacat  | aattacttat | 540  |
| ttcttattca  | gtaaaacacc  | acaattgctc  | actactttta  | gctgcgtagt  | gatcatataa | 600  |
| attgtggtat  | gagaagccgt  | gtctttgtgg  | ggaaagagat  | gagagagtaa  | gttgcaaagc | 660  |
| ttggggattc  | acaacacatg  | gtaatacccc  | actgagcttc  | aggaaataaa  | gtcaaaagga | 720  |
| agaaattact  | gttattacta  | caggacctta  | ctacatttga  | gatagctcac  | atttagccag | 780  |
| gtgattacct  | tatttgccta  | atcataaatc  | ttgtacctgt  | gcacttaacc  | gtttacatac | 840  |
| ctcctttctg  | tgtagtgttt  | aagttttatt  | cctaatttat  | ttgtctgcaa  | cttgaatgtg | 900  |
| ggctaaagat  | ttacaaaatg  | ataaaagcac  | cacatcatct  | gagcttggat  | gagaatttaa | 960  |
| tgatggataa  | tgctattgtg  | atggaaattt  | gtgctgtggt  | gtcttataca  | aagaggagaa | 1020 |
| ggaggggaag  | gaggaggggg  | aagaggggaag | agggaagaaga | aggggaggag  | aaaaaaattt | 1080 |
| ttgttaaaat  | gctagaaaatt | gagtttccta  | ttatcatcat  | gtatataaac  | acattatgga | 1140 |
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| agaattgggt | cacacataaa | atgcactaac | gctaatagaca | gctgatgagc | tgaaaaaaaa | 180 |
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| gtagtgaagt  | caccagtaaa  | gttgctcttc  | ggcaagcttt  | acatgtgggtc | agaggtggct  | 180  |
| tgtattgggtc | attctttcat  | gcccgtgtac  | tatcaggctg  | tttctgggtc  | gcctgctact  | 240  |
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| acttgctagg  | aagagcttgc  | cttattttttt | taagtttttc  | aatttaaagg  | ttatttttaa  | 9480  |
| ataagtgtga  | tacctccatg  | gttactatta  | ctgttttttt  | aactactatt  | attaatatgt  | 9540  |
| ctaagagcca  | acatttttta  | aaaacatgta  | ttatgtacag  | acactgtgcc  | atatactatt  | 9600  |
| agcatggact  | aaatcattta  | acctcacaaa  | aaatggatgc  | tattattgtg  | cctatttttat | 9660  |
| cattgaggaa  | gctgaggcct  | aaagaaatga  | ggtaatttgc  | tcgaccttat  | ggagggaagt  | 9720  |
| ttcagaattt  | ttgtacattt  | tgcaagtagt  | gaatgaataa  | catattttca  | tgtttatattt | 9780  |
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| accaattttt  | atcttactgg  | actgcaagcc  | ccattctacc  | ctacatttat  | tttcagatgg  | 9960  |
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| taaaagctaa  | ttcagaaaaa  | aatatgtgct  | gcaatttact  | tggttgagtg  | ctattttacca | 10080 |
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| tgcaagggcat | gagaaaaatg  | gttatgcttt  | gggtagaagc  | tcaacttcca  | aagtaaacac  | 10200 |
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| ctttatcttt  | catgtgcagt  | cgtgatattt  | atagagtttt  | aagattaact  | cagataaaaa  | 10320 |
| tacaaattat  | ataaaaaatac | aatttggtgc  | tttggtattca | gtgactagca  | cctggaaaaat | 10380 |
| agtatatcca  | gaagatgtga  | ctaaaatttt  | ggccagtttc  | ccctcttttg  | atcaacaaaa  | 10440 |
| ctcattgaag  | agtattctcg  | gaacatagtc  | atttaacata  | tttttattaa  | ttgtggaaaa  | 10500 |
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| tatgatatga  | ttgagcatag  | tagaatgtat  | ttattattta  | tttgagagta  | tcttggtttg  | 10680 |
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| agaatgcgca  | ttctttgtgg  | gtctagtttt  | ccatctatgc  | ctgttatgtc  | aaatatgcaa  | 11400 |



|             |             |             |             |             |             |       |
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| tggcttttact | acaagtatta  | taggtatatc  | catttgtcct  | tgtagttctg  | ttgatttttg  | 11520 |
| cagtatatat  | ttttaagcta  | taatggtagg  | tacataaatg  | cttaaaagtt  | gtaattttact | 11580 |
| ggtgaaatta  | gtctttttatt | actagggggg  | atttttcttt  | attccaattg  | ttttctccag  | 11640 |
| gaggggttgg  | aaaaattacc  | aagttaaaca  | tttctggaat  | aaaatatctt  | caaataaact  | 11700 |
| ctgctgggaa  | tacatagttt  | cttcttgccg  | tcactgagag  | aaggaggcaa  | tcaggtaaat  | 11760 |
| ggcccttaca  | gtatagtttt  | agaagtattg  | tagcaaaaca  | tggcattctg  | tgatagccct  | 11820 |
| tagaagggtca | cttaaccag   | acttagttga  | caagggcatt  | tccagaagag  | gtggcatctg  | 11880 |
| aactgggttt  | gaaagtatgt  | aagagttggc  | cgtgacaaaa  | acaggaatga  | aggcagaggg  | 11940 |
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| tgctattttca | aggtgttttt  | aaatgttgcc  | aattataaat  | aaataacact  | gcagtggaga  | 12120 |
| acttttagca  | ttattctttg  | tccttgtccc  | ctactagttc  | ttgaggacaa  | gtttcttgaa  | 12180 |
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| agtgaattga  | aggaagggtta | aataatttct  | tacgggttgg  | cttgggtaca  | ggtctggtga  | 12420 |
| gtcatgttga  | cagagtgggc  | ttaagtgcaa  | actaggatta  | tacttgattc  | catcaaagag  | 12480 |
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| gaaccatttt  | gtaccatatt  | ccccaaataa  | ttataatgat  | tatctttcat  | atgccagaac  | 12600 |
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| ctgtattcat  | cataaaaattg | tgagaattaa  | attgtgcatg  | tgaaaatatc  | cggaatgtct  | 12900 |
| ttgcagcaca  | atgacaatta  | ttttctctcc  | cattatgaat  | acataaattt  | gcccagggtt  | 12960 |
| aatatgcctc  | ttagtatagt  | ttagagaagc  | tttacaagg   | taaaccaagg  | atgagctgcg  | 13020 |
| tatcctgagc  | atcttctgtc  | tcagaggtgg  | ctacctcat   | ttaggggcaa  | agtccacgct  | 13080 |
| ggagagagca  | cctcaccttt  | ctttgattgc  | tagattgaga  | agaaaatgag  | gatctcagcc  | 13140 |
| tttaaagctt  | tccattttatc | agctttttaca | cattcaagaa  | gcatttcatt  | tttatgttgc  | 13200 |
| aatagcatgt  | atttccttct  | cttaggtcac  | ctttgccttc  | tttgtactta  | gtccctattc  | 13260 |
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| caaaatatca  | cggcaggcta  | actaattttg  | cccagacttt  | ctgcgaaagc  | tccacatgtg  | 13380 |
| ctgcagtgtt  | gggttgcata  | attgatttaa  | tctctaattt  | tagaggaaag  | ctgaactctt  | 13440 |
| tttgtgggac  | tctgcataca  | tttctctagg  | gcaaaaactg  | tctacttttt  | ttctctctgg  | 13500 |
| tatctcttta  | gtgctaggcc  | actttttttt  | tttttttttt  | tttttttttt  | ttttttccca  | 13560 |
| aagactctaa  | actaccctcc  | gtgaaataaa  | tgaaatcaca  | gttggaatac  | agcttactgg  | 13620 |
| acagacttgt  | aatggcaaga  | taacagctac  | gccatacaca  | tttactaaac  | attttcatcc  | 13680 |
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| acctgtctga  | atcttgcttg  | ctttcagcag  | agtactagag  | taatggctgt  | gaaggctgaa  | 13920 |
| ctataaaaaat | aggtatgtag  | caagcttttag | acttaccttg  | tgcttttttg  | ctatccagg   | 13980 |
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| atgaaaacca  | ggcaattgta  | agtttactag  | ttatttcaca  | ttgtatttag  | caatgtcatt  | 14100 |
| tttggttatc  | ttttcgggaa  | tttatatact  | gggaagtgcg  | atttgatagc  | cgggtggttt  | 14160 |
| tattaacctg  | tctgatttgg  | aatataattt  | tgggattacc  | ttcccaccag  | ttacttctca  | 14220 |
| aacaactgac  | tttaataact  | ttagtatttt  | tgtactctaa  | gacatatgtt  | ccattgaaac  | 14280 |
| taaccttcct  | caggtccata  | ctcactaacg  | ctaatttgac  | aaattccctg  | aacaattctc  | 14340 |
| ataccataga  | agtatgaatt  | ttcatacca   | actccactgt  | taacatcaat  | aaaattaggt  | 14400 |
| cagaaagaat  | tccaactgct  | gtctgagtat  | catagcctta  | tgtctttatg  | agtctttatg  | 14460 |
| ctgctaaaag  | aatttagttt  | tagaaaataa  | cctcttatct  | gttaaataaa  | cacttagcat  | 14520 |

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|------------|------------|------------|-------------|-------------|-------------|------------|-------|
| aaacagatct | gtgttcaa   | at         | agattctgtt  | acttaatagt  | tggatcaatt  | tagacaagtc | 14580 |
| ccttaacctg | taagcctctt | tatgtgcaaa | tattttaa    | ac          | tgggataata  | attatactga | 14640 |
| cttctcaggt | ttgttgtgag | gagtaaatgc | taaaatgcat  | ataaagagat  | ttgaaggtta  |            | 14700 |
| tctagccata | gacagtgtat | caggcaggtt | ttgccataat  | aatgggtgtgt | aacaatcccc  |            | 14760 |
| aaatctcagt | ggtttacatc | aagaaatatt | tgtgttagac  | ttagttgaac  | ttgggtccag  |            | 14820 |
| cttgtgcatt | ctattcaggt | ttgctctgca | tatctcttca  | ttcagatacc  | acaggctatt  |            | 14880 |
| taagaaatcc | tgtattcatg | gtagagaaca | acattgaaag  | agatctggta  | aaaaatgaaa  |            | 14940 |
| taaaacaaaa | caaaacaact | tgccaagtcc | cttaaagcat  | caactgaaaa  | ctaataattcc |            | 15000 |
| taccactttc | acacaaat   | ttc        | cattgggtcaa | agcaagtc    | atgaccagga  | taaatattag | 15060 |
| taggtcagga | aagtttacac | tgccctaata | aagaaagaag  | agtgaatacc  | tggtgaataa  |            | 15120 |
| tacatgagtc | tccttcaaag | aagtttactg | aatctttttt  | atcctactct  | tatttcatct  |            | 15180 |
| gcatgaccat | tgactcctcc | atatagtcta | cttcacagta  | tctacattgc  | attattgaaa  |            | 15240 |
| ttatactgca | atttctccct | ctctttcttt | taatttcaaa  | ttgatttgaa  | tgatatactt  |            | 15300 |
| ttctttgtaa | acag       |            |             |             |             |            | 15314 |

&lt;210&gt; 219

&lt;211&gt; 9730

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 219

|             |             |             |            |             |             |      |
|-------------|-------------|-------------|------------|-------------|-------------|------|
| gtaagtacta  | attatattca  | catccaaatg  | agggtgatt  | ttttagggtcc | atattgacat  | 60   |
| atgttgcaaa  | tgtcaatcta  | cttactactga | atcatataac | tcatctgctt  | tttaagataa  | 120  |
| gaataaaaa   | tcaaagagtc  | atttaaagac  | ttaaattctt | agttttttaga | ttctatatta  | 180  |
| aattcatggt  | tttcatgatt  | attctatttc  | caagggtggt | gaaaacatta  | tatttttgatt | 240  |
| ccttaagggtg | aaaagcatgt  | aggaagagat  | atttttgaag | caacttggtt  | ttagttcatt  | 300  |
| tgattgttta  | tttattttatt | taatgaattt  | aagcaatggg | ctagggttcta | gggttggtaa  | 360  |
| agtgaatatag | atgttattct  | gttgctactg  | ctatatcatt | ttattttgtga | tagtgcta    | 420  |
| aagctatttag | tatttaaatgg | gtagtactga  | cttctataca | accatctcca  | gtgaatgtgg  | 480  |
| aatttggttag | aacttaaaata | aaaagcaaaa  | ctaaaaagaa | aaccacgtcc  | tcacacttgg  | 540  |
| agaaatattc  | agctaataca  | ttgattgtct  | ttttgtacac | agagcaacat  | atccaagtga  | 600  |
| aagtttagct  | agtgtttttg  | tgttttataat | agagatggat | gttctctctt  | cctgttatac  | 660  |
| attgatata   | aaagaggatg  | agaaaaaatg  | caagcaaat  | tttctggatc  | tggttgattt  | 720  |
| aaggcctttg  | ggaattgtta  | acttaaaatt  | aaaaggtact | catagcttat  | tattattcaa  | 780  |
| aatttattca  | gttttgata   | tttttgtcaa  | ctaccaaacc | ttcaccatgt  | tagtgacatt  | 840  |
| attataatat  | tgtgtatgg   | ggtatgagaa  | ttagaatgct | taaagaaatg  | atgctgatgc  | 900  |
| atcttagctt  | acattgaaat  | atctttcctt  | ttgccaatt  | ttatttagat  | cccactgagt  | 960  |
| tcttgtaagt  | atattataag  | tatacataca  | tgaataattt | ttgtctagag  | agaaagagag  | 1020 |
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| ttccaaaatg  | actgatttta  | tattatata   | aaaagacgac | tcagtttaata | ttgtgctttt  | 1140 |
| aactagaaac  | agagaaaagt  | caatgagtag  | aagcaataga | ggtacatcag  | aagaaaacca  | 1200 |
| gcagagagtg  | gatccagcac  | aagtttagat  | atatacacac | atataatgtgg | ggcatgccat  | 1260 |
| tctatcatga  | ggaagtga    | cagcttcaga  | gaaaagatca | cttttattta  | tcaccacca   | 1320 |
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| cagttcaaag  | tgtataatat  | agcattgatt  | ttgtgttgga | atgtgttcta  | tccgcctatc  | 1440 |
| tctctctctt  | tttcttttagc | atttttaaag  | acattttcta | gacataaggc  | aaagagtaaa  | 1500 |
| tcttctgaag  | ataaagaagg  | gctgcttctt  | aagtatgtct | gaacaaat    | ctcccgaata  | 1560 |
| agaaatgcca  | tatcctatgg  | cattcaatga  | gaattagcaa | ggtttctcat  | gttttctagt  | 1620 |
| gttgacag    | atgataaaaa  | accaaacc    | aatgaaacaa | aaccctaaag  | cccagacacag | 1680 |
| tctccagagc  | cagccttgtt  | tctttcagct  | ttgatcacag | tcagttgggt  | cttcattga   | 1740 |

|             |             |             |             |             |             |      |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| actcactgga  | gagccattga  | cgagcccatg  | aactgacctt  | aagccagcag  | aatgagtcct  | 1800 |
| aggaatgcag  | ttctttcttt  | tttttttttt  | tattattatt  | atactttaag  | ttttttcatg  | 1860 |
| gaaaagtacc  | aaggatgttc  | tccagtgggt  | tgctctcggt  | aatttaatga  | gcttatatgc  | 1920 |
| atltcaacaa  | attcaggcca  | tactggacac  | atltttctaa  | gagagtacta  | gctactttca  | 1980 |
| aaagctacca  | actttgggcc  | aggcgtgatg  | gctcacacct  | gtaatctcag  | cactttggga  | 2040 |
| ggtggaggta  | ggtggatagc  | ttgagcgcag  | gagtttgaga  | ccagcctagg  | caacatgggtg | 2100 |
| aaaccccgctc | tctacaaaaa  | cacaaaaatt  | agctggatgt  | gatgggtgcat | gcctgtagtc  | 2160 |
| ccagctactt  | ggaaggctga  | ggtggattgt  | tttagcctgg  | gagagagagg  | ttgcaatgag  | 2220 |
| ctgagattat  | gccactacac  | accagcctgg  | gtgacagagc  | cagatactgt  | cttaaaaaaa  | 2280 |
| aaaaaaaaga  | aagaaaagct  | ataagctacc  | aactctgttt  | tgtgggaaga  | aacggagtag  | 2340 |
| ccatctactt  | ttaaagtaaa  | taatacacag  | tgaactagcc  | tcttctgggtc | tttctctaga  | 2400 |
| ggcatctgga  | ttcaagcatc  | ctctgcttag  | ctaagtttcc  | atcaccatgt  | tttccaactt  | 2460 |
| ccaaaacttt  | gttgatctct  | gttgtcattt  | gttgtcttct  | tgcatgtggc  | atgggtgggtt | 2520 |
| gctgcaccta  | tcaacctgcc  | atctagggtt  | tcagcccccac | atgcgttagg  | tatttgcctt  | 2580 |
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| cactgtgtcc  | atgtattgtc  | attattcaac  | tcccacttat  | gagtgagaac  | atgcgggtgtt | 2700 |
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| gccacatttc  | tttatccagt  | ctatcattga  | tgggcatttg  | ggttggttcc  | aagtctttgc  | 2880 |
| tattgtgaat  | agtgtgcaa   | taaacatatg  | tgtgcatgtg  | tctttatagt  | agaatgattt  | 2940 |
| ataaataatc  | ctttgggtat  | atccccagta  | gtgggattgc  | tgagtcaa    | ggtatttctt  | 3000 |
| gttctagatc  | cttgaggaat  | cgccacactc  | tcttccacaa  | tgggtgaact  | aatttacact  | 3060 |
| cccaccaaca  | gtgtaaaaagt | gttccctattt | ctccacaggc  | tcaccagcat  | ctgttatttc  | 3120 |
| ctgacttttt  | aataattgcc  | tttctgactg  | gcatgagata  | gtatctcatt  | gtggtttttc  | 3180 |
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